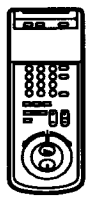
SERVICE MANUAL

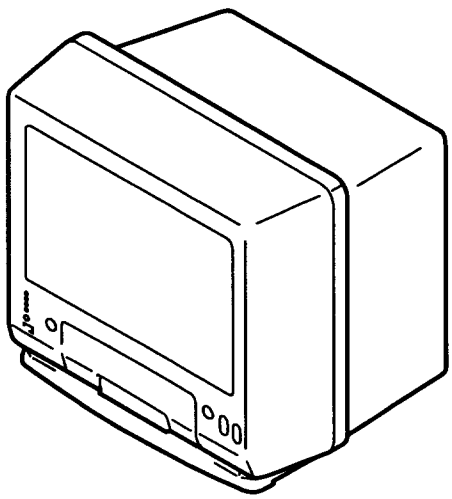
BC-2 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-V2120K	RM-847	OIRT	SCC-G35D-A

MODEL	COMMANDER	DEST.	CHASSIS NO.

- Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS III for MECHANICAL ADJUSTMENTS. (9-973-211-11)





TV + VIDEO
dwo
VHS
PAL NTSC

MICROFILM

TRINITRON® COLOR VIDEO TV

SONY®

TV Section

Television system	B/G, I, D/K, M
Color system	PAL/SECAM and NTSC3.58 / NTSC4.43
Channel coverage	See "Receivable channels and channel display" on page 33.
Picture tube	Trinitron 21 inches (approx. 50.6 cm measured diagonally)
Antenna in	75-ohm antenna socket for VHF/UHF

Video Section

Format	VHS standard
Video recording system	Rotary 2-head helical scanning system
Audio recording system	Monaural
Video signal	PAL/MESECAM/NTSC
Tape speed	PAL/MESECAM 23.39 mm/sec. NTSC 33.35 mm/sec.
Maximum recording time	PAL/MESECAM 240 minutes with E-240 NTSC 160 minutes with T-160

Inputs and Outputs

Inputs	LINE IN VIDEO: phono jacks 1 Vp-p, 75 ohms, unbalanced, sync negative LINE IN AUDIO: phono jacks Input level: 500 mVrms
Outputs	MONITOR OUT VIDEO: phono jack 1 Vp-p, 75 ohms, unbalanced, sync negative MONITOR OUT AUDIO: phono jack Input impedance: more than 47 kohms
Headphones jack	Monaural minijack

General

Clock	Quartz locked
Power requirements	110 – 240 V AC, 50/60 Hz
Power consumption	123 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	– 20°C to 60°C (– 4°F to 140°F)
Dimensions	552 × 524 × 470 mm (21 3/4 × 20 3/4 × 18 5/8 inches) (w/h/d)
Mass	25.8 kg (56 lb 14 oz)

Accessories supplied

Remote Commander (1)
R6 (size AA) batteries (2)
AC plug adaptor (1)

Design and specifications are subject to change without notice.

Receivable Channels and Channel Display

System	Area	Channel coverage	Channel display
B/G, H	Middle East/Asia	E-2 to E-12 E-21 to E-69	C02 to C12 C21 to C69
	Indonesia	1A 2 to 11	C01 C03 to C12
	Morocco	M-4 to M-7 M-8 to M-10	C70 to C73 C08 to C10
	CATV	S-01 to S-05 S-1 to S-41	S42 to S46 S01 to S41
I	Hong Kong/ United Kingdom	B-21 to B-69	C21 to C69
	Ireland	A, B, C,.....J	C01 to C09
	South Africa	4 to 13 21 to 68	C04 to C13 C21 to C68
	Angola	1 2 to 3	C00 C02 to C03
	CATV	S-01 to S-05 S-1 to S-41	S42 to S46 S01 to S41
D/K,K1	East European countries	R-1 to R-2 R-21 to R-60	C01 to C12 C21 to C60
	China	C-1 C-2 C-3 C-4 C-5 C-6 C-7 to C-12 C-13 to C-24 C-25 to C-47 C-48 to C-57	C01 C02 C13 C03 C04 C14 C06 to C11 C21 to C32 C38 to C60 C61 to C70
	Ivory Coast	1 to 3	C71 to C73
	CATV	S-1 to S-39	S01 to S39
M	America	A-2 to A-13 A-14 to A-83	C02 to C13 C14 to C83
	CATV	A-8 A-7 A-6 A-5 to A-1 A to E F to W+28 W+29 to W+58	S01 S05 S06 S95 to S99 S14 to S18 S19 to S64 S65 to S94

TABLE OF CONTENTS

Section	Title	Page
TV SECTION		
1.	**GENERAL**	4
2.	**DISASSEMBLY**	
2-1	Rear Cover Removal	17
2-2.	Chassis Assy Removal	17
2-3.	D3 Board Removal	18
2-4.	Service Position	18
2-5.	Picture Tube Removal	19
3.	**SET-UP ADJUSTMENTS**	
3-1.	Beam Landing	20
3-2.	Convergence	21
3-3.	Focus	23
3-4.	Screen (G2) and White Balance	23
4.	**CIRCUIT ADJUSTMENTS**	
4-1.	D3 Board Adjustments	24
5.	**DIAGRAMS**	
5-1.	Block Diagram (TV Section)	27
5-2.	Circuit Boards Location (TV Section)	31
5-3.	Schematic Diagrams and Printed Wiring Boards (TV Section)	
(1)	Schematic Diagram of D3 Board (1/2)	32
(2)	Schematic Diagram of D3 Board (2/2)	35
(3)	Schematic Diagram of C Board	41

Section	Title	Page
VIDEO SECTION		
1.	**GENERAL**	45
2.	**DISASSEMBLY**	46
3.	**CIRCUIT ADJUSTMENTS**	48
4.	**SYSTEM CONTROL INTERFACE**	54
5.	**DIAGRAMS**	65
6.	**EXPLODED VIEWS (TV SECTION)**	111
6.	**EXPLODED VIEWS (VIDEO SECTION)**	120
7.	**ELECTRICAL PARTS LIST (TV SECTION)**	113
7.	**ELECTRICAL PARTS LIST (VIDEO SECTION)**	127

CAUTION

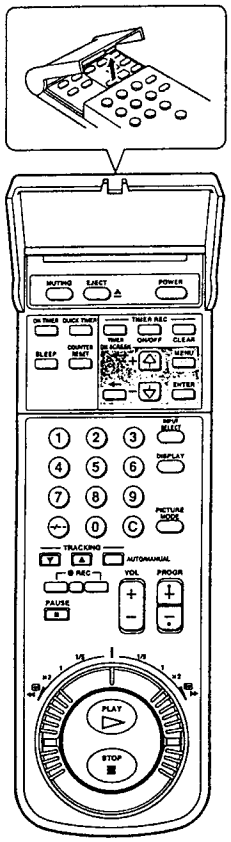
SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remein as in the manual.

Step 3 — Tuning in to TV Stations



To stop automatic channel presetting

Press ⇐ on the Remote Commander.

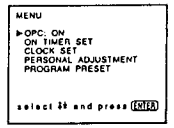
You should preset the channels (up to 80 channels) by choosing either the automatic or manual method.
The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you want to allocate program numbers to the channels one by one.

Before you begin

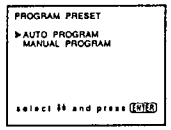
- Press the POWER switch on the video TV to switch it on.
  If the STANDBY lamp on the video TV is lit in red, press POWER, PROGR +/– or a number button on the Remote Commander.
- Lift the flap on the Remote Commander and locate Menu operation buttons.

Presetting Channels Automatically

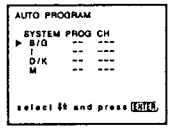
1 Press MENU.
The main menu appears.



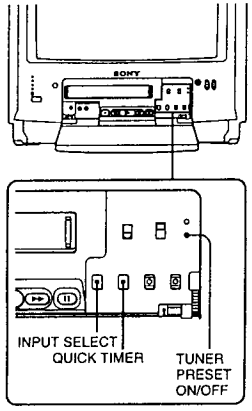
2 Move the cursor (▶) to "PROGRAM PRESET" with +⇧ or –⇩ and press ENTER.
The PROGRAM PRESET menu appears.



3 Move the cursor to "AUTO PROGRAM" with +⇧ or –⇩ and press ENTER.
The AUTO PROGRAM menu appears.



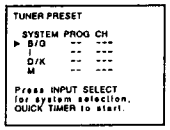
4 Using +⇧ or –⇩, move the cursor to the TV system (B/G, I, D/K or M) of the channels which you want to preset, and press ENTER.
Presetting starts from program position 1. The preset program and channel numbers are displayed on the screen in sequence.
When presetting is finished, the channel received before starting automatic presetting appears. All available channels are now stored on successive number buttons.



To preset channels automatically using the TUNER PRESET button on the video TV

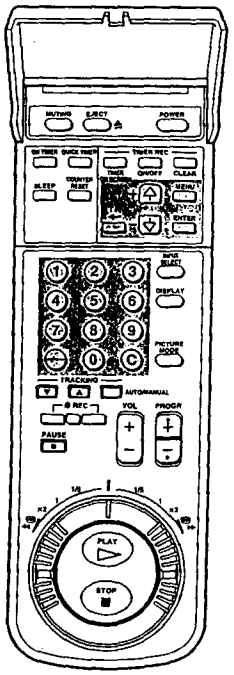
1 Press the POWER switch on the video TV to switch it on.

2 Press TUNER PRESET ON/OFF with a pointed object.
The following display appears.



3 Press INPUT SELECT on the video TV to select the TV system of the channels which you want to preset.

4 Press QUICK TIMER on the video TV.
Presetting starts from program position 1.
When presetting is finished, the program position from which presetting starts appears.



For program positions beyond 6

The display scrolls by pressing –◇ repeatedly.

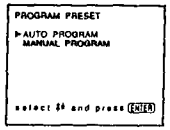
If you have made a mistake

Press ← to go back to the previous position.

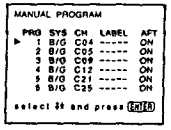
Presetting Channels Manually

1 Press MENU to display the main menu.

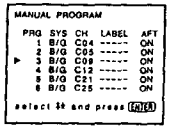
2 Move the cursor (▶) to "PROGRAM PRESET" with +◇ or –◇ and press ENTER.
The PROGRAM PRESET menu appears.



3 Move the cursor to "MANUAL PROGRAM" with +◇ or –◇ and press ENTER.
The MANUAL PROGRAM menu appears.



4 Using +◇ or –◇, move the cursor to the program position (number button) to which you want to preset a channel, and press ENTER.



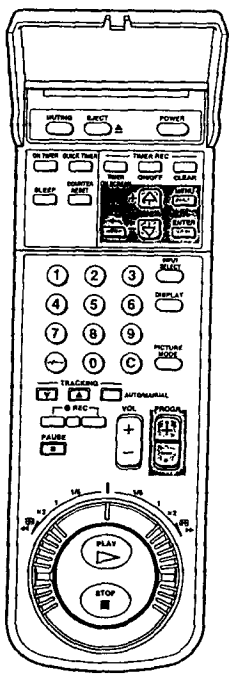
5 Select the TV broadcast system (B/G, I, D/K or M) with +◇ or –◇, and press ENTER.
The CH number turns red.

6 Search for the channel with +◇ (up) or –◇ (down).
The channel number starts counting up or downwards. When a channel is found, it stops.
If you want to preset this channel, press ENTER. If not, press +◇ or –◇ to search for another channel.

You can also select the channel number directly with the number buttons. Press C (once for regular channels, twice for cable channels), number buttons (e.g. For 06, press 0 and 6), then ENTER.

7 Repeat steps 4 to 6 to preset other channels.

8 After you finish presetting, press MENU to go back to the original screen.



For program positions beyond 6

The display scrolls by pressing –◇ repeatedly.

Skipping Program Positions

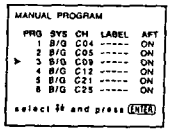
You can skip unused program positions when selecting program with the PROGR +/– buttons. However, the skipped programs may still be called up when you select them with the number buttons.

1 Press MENU to display the main menu.

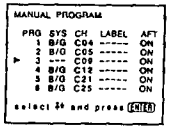
2 Move the cursor (▶) to "PROGRAM PRESET" with +◇ or –◇ and press ENTER.
The PROGRAM PRESET menu appears.

3 Move the cursor to "MANUAL PROGRAM" with +◇ or –◇ and press ENTER.
The MANUAL PROGRAM menu appears.

4 Using +◇ or –◇, move the cursor to the program position which you want to skip and press ENTER.
The "SYS" position turns red.



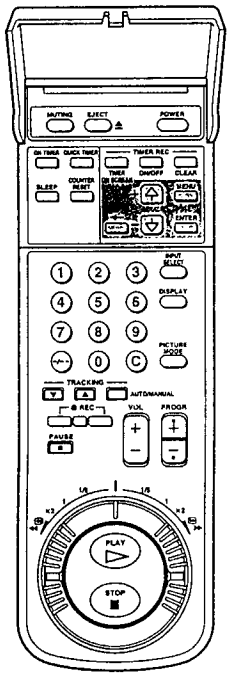
5 Press +◇ or –◇ until "---" appears in the "SYS" position and press ENTER.



When you select programs using the PROGR +/– buttons, the program position is skipped.

6 Repeat steps 4 and 5 to skip other program positions.

7 Press MENU to go back to the original screen.



If you have made a mistake

Press ← to go back to the previous position.

Captioning a Station Name

You can name a channel using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. MTV). Using this function, you can easily identify which channel you are watching.

1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAM PRESET" with +↑ or –↓ and press ENTER. The PROGRAM PRESET menu appears.

3 Move the cursor to "MANUAL PROGRAM" with +↑ or –↓ and press ENTER. The MANUAL PROGRAM menu appears.

MANUAL PROGRAM

	PRG	SYS	CH	LABEL	AFT
▶	1	B/G	C04	-----	ON
	2	B/G	C05	-----	ON
	3	B/G	C09	-----	ON
	4	B/G	C12	-----	ON
	5	B/G	C21	-----	ON
	6	B/G	C25	-----	ON

select ↑↓ and press ENTER

4 Using +↑ or –↓, move the cursor to the program position you want to caption and press ENTER repeatedly until the first element of the "LABEL" position turns red.

5 Select a letter or number with +↑ or –↓ and press ENTER. The next element turns red. Select other characters in the same way. For the element you want to leave blank, select "–" and press ENTER.

MANUAL PROGRAM

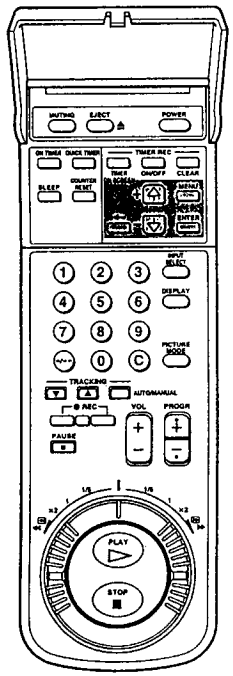
PRG	SYS	CH	LABEL	AFT
1	B/G	C04	-----	ON
2	B/G	C05	-----	ON
3	B/G	C09	MTV--	ON
4	B/G	C12	-----	ON
5	B/G	C21	-----	ON
6	B/G	C25	-----	ON

select ↑↓ and press ENTER

6 After selecting all the characters, press ENTER repeatedly until the cursor appears again. Now the caption you chose is stored.

7 Repeat steps 4 to 6 to caption other channels.

8 Press MENU to go back to the original screen.



To reactivate automatic fine tuning (AFT)

Repeat from the beginning and select "ON" in step 5.

Manual Fine-Tuning

Normally, the automatic fine-tuning (AFT) is already working. However, if the picture of a program is distorted, you can use the manual fine-tuning function to obtain better picture reception.

1 Press MENU to display the main menu.

2 Move the cursor (▶) to "PROGRAM PRESET" with +↑ or –↓ and press ENTER. The PROGRAM PRESET menu appears.

3 Move the cursor to "MANUAL PROGRAM" with +↑ or –↓ and press ENTER. The MANUAL PROGRAM menu appears.

4 Using +↑ or –↓, move the cursor to the program position corresponding to the channel which you want to manually fine-tune, and press ENTER repeatedly until the AFT position turns red.

MANUAL PROGRAM

	PRG	SYS	CH	LABEL	AFT
	1	B/G	C04	-----	ON
	2	B/G	C05	-----	ON
	3	B/G	C09	-----	ON
▶	4	B/G	C12	-----	ON
	5	B/G	C21	-----	ON
	6	B/G	C25	-----	ON

select ↑↓ and press ENTER

5 Fine-tune the channel with +↑ or –↓ so that you get the best TV reception. As you press these buttons, the frequency changes from –15 to +15.

MANUAL PROGRAM

PRG	SYS	CH	LABEL	AFT
1	B/G	C04	-----	ON
2	B/G	C05	-----	ON
3	B/G	C09	-----	ON
4	B/G	C12	-----	-3
5	B/G	C21	-----	ON
6	B/G	C25	-----	ON

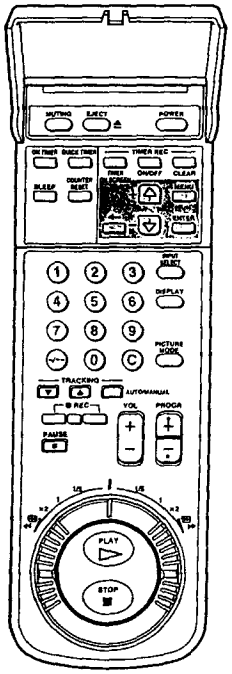
select ↑↓ and press ENTER

6 After fine-tuning, press ENTER. The cursor appears beside the next program position. Now the fine-tuned level is stored.

7 Repeat steps 4 to 6 to fine-tune other channels.

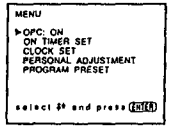
8 Press MENU to go back to the original screen.

Step 4 — Setting the Clock



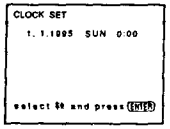
You need to set the clock for using timer recording, quick-timer recording and on timer functions. Before you begin, lift the flap on the Remote Commander and locate the Menu operation buttons.

1 Press MENU to display the main menu.

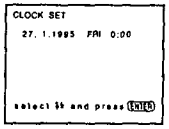


2 Move the cursor (▶) to "CLOCK SET" with +❖ or –❖ and press ENTER.
The CLOCK SET menu appears.

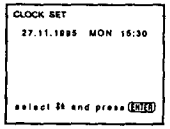
3 Press ENTER to start setting the clock.
The day section turns red.



4 Set the day with +❖ or –❖ and press ENTER.
The month section turns red.



5 Using +❖ or –❖ and ENTER, set the month, year, hour and minute in the same way as in step 4.



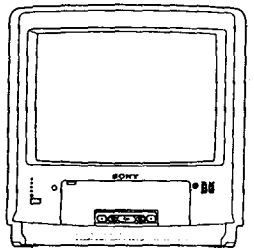
6 After setting the minute, press ENTER.
The clock starts working.

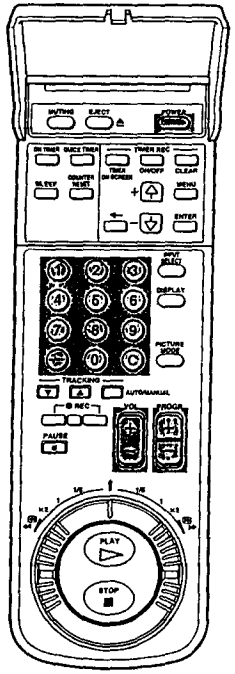
7 Press MENU to go back to the original screen.

If you have made a mistake
Press ← to go back to the previous position.

If power is interrupted or you disconnect the AC power cord
You have to re-set the clock.

Watching the TV





This section explains the basic functions you use while watching the TV. Most of the operations can be done using the Remote Commander.

Switching the TV on and off

Switching on

Press POWER on the video TV.

Switching off

Press POWER on the Remote Commander.
The video TV enters standby mode and the STANDBY lamp on the front of the video TV lights in red.

To switch on again
Press POWER, PROGR +/– or number buttons on the Remote Commander or PROGR +/– on the video TV.

To switch off the main power
Press POWER on the video TV. The STANDBY lamp lights in amber.

Selecting TV Programs

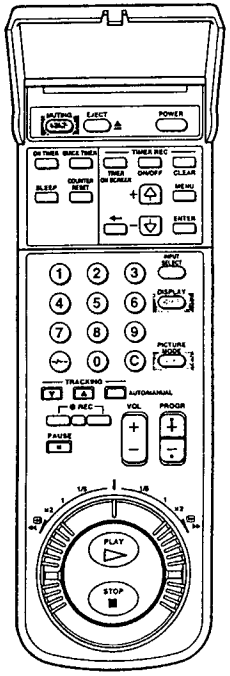
Press PROGR +/– or number buttons on the Remote Commander or PROGR +/– on the video TV.

To select a double-digit number using the number buttons

Press -/--, then the numbers.
For example, if you want to choose 14, press -/--, 1 and 4.

Adjusting the Volume

Press VOL +/– on the Remote Commander or VOLUME +/– on the video TV.



Note

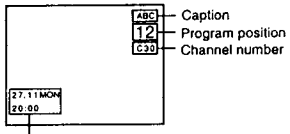
You can adjust the video playback picture and line input picture in the same way.

Muting the Sound

Press MUTING.
The MUTING indicator appears and stays on the screen.
To resume normal sound, press MUTING or VOL +.

Displaying the On-screen Indications

Press DISPLAY to display the following on-screen information.
To have the program number, channel number and caption stay on the screen, press DISPLAY again.
To make the indications disappear, press DISPLAY until no indications are displayed on the screen.



Adjusting the Picture

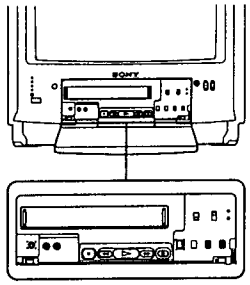
By pressing the PICTURE MODE button you can select one of four settings for picture effect. You can also adjust the picture to suit your own taste.

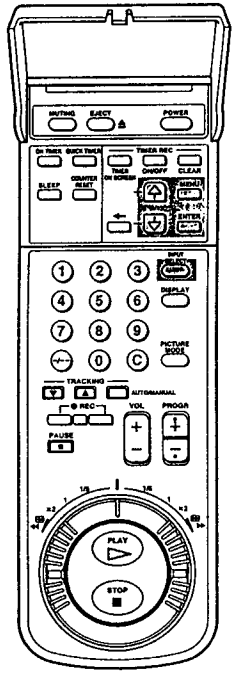
Selecting the picture effect

Press PICTURE MODE.
With each press, you can select "DYNAMIC," "MIDDLE," "SOFT" or "PERSONAL," cyclically.

Effect of each setting

Setting	Picture effect
DYNAMIC	More contrast
MIDDLE	Less contrast
SOFT	Darker e.g. when watching a movie
PERSONAL	The adjusted picture control levels are stored. (See "Adjusting the picture displayed on the screen.")





Adjusting the picture displayed on the screen

1 Press MENU to display the main menu.

2 Move the cursor(▶) to PERSONAL ADJUSTMENT with +⇧ or –⇩ and press ENTER.
The PERSONAL ADJUSTMENT menu appears.

3 Using +⇧ or –⇩, select the item you want to adjust and press ENTER.

4 Adjust the picture with +⇧ or –⇩ and press ENTER.
With each press the vertical bars increase or decrease and the figure at the right margin changes to show the control level. (See the table below.)

5 Repeat steps 3 and 4 to adjust other items.

6 Press MENU to go back to the original screen.

Effect of each control

PERSONAL ADJUSTMENT	Effect
PICTURE	Less ····· More
COLOR	Less ····· More
BRIGHTNESS	Darker ····· Brighter
HUE*	Reddish ····· Greenish
SHARPNESS	Softer ····· Sharper
RESET	Resets all the items to the factory preset levels.

* The HUE adjustment is available only for the NTSC color system.

The adjusted control levels are stored in "PERSONAL."
When you select "PERSONAL" with PICTURE MODE, you can call up the adjusted levels.

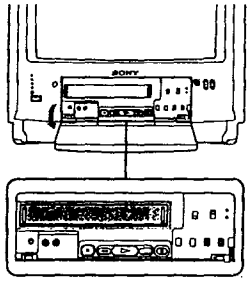
Watching Line Input

Press INPUT SELECT so that "LINE" appears on the screen.
To go back to the normal TV picture, press INPUT SELECT so that the program position appears.
For details of the line input picture, see page 29.

Listening with Headphones

Plug the headphones (not supplied) to the ∩ (headphones) jack inside the front panel on the video TV.
The sound from the speaker is shut off.

Playing a Tape



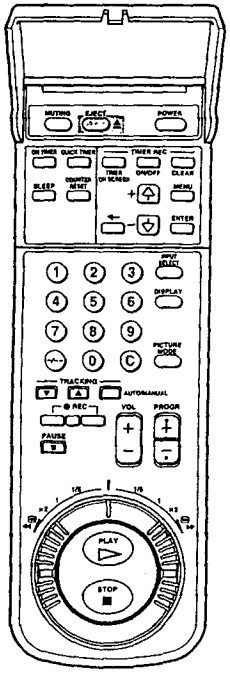
This section shows you how to insert a cassette and to play it. More convenient functions you can use while playing a tape is shown in "Additional Operation."

Inserting a Video Cassette

1 Press the POWER switch on the video TV.

2 Open the front panel on the video TV.

3 Gently press the center of the front side of a cassette with the arrow indication facing upwards. The cassette is automatically loaded into the cassette compartment.
The indicator appears on the screen and stays until the cassette has been loaded.
The video TV turns on automatically when it is in standby mode. If you insert a cassette with its safety tab removed, playback starts automatically.

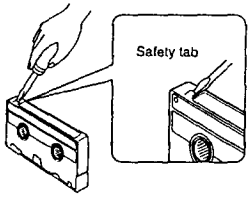


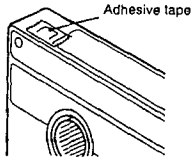
Ejecting a Video Cassette

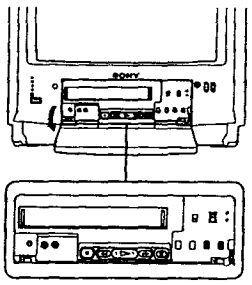
Press EJECT ≜ on the video TV or the Remote Commander.
The indicator appears and stays until the cassette is ejected.
You can eject the cassette even if the power is off.

Protecting Your Cassette against Accidental Erasure

The cassette is provided with a safety tab to protect against accidentally erasing a previous recording. Break off the safety tab with a screw driver or a similar tool. If the safety tab is removed, the cassette is ejected when you try to record on it. To record on a cassette with the safety tab broken off, simply cover the tab hole with adhesive tape.





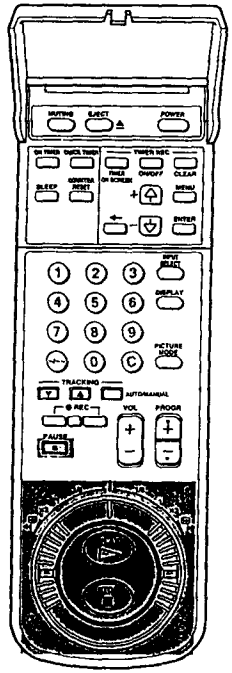


Playing a Tape

1 Press POWER on the video TV.
When the STANDBY lamp is lit in red, skip this step.

2 Insert a cassette.
If you insert a cassette with its safety tab removed, playback starts automatically.

3 Set the COLOR SYSTEM switch to conform to the color system of the tape to be played. Normally, set it to AUTO. If streaks appear when playing a tape, switch it to select the color system.
PAL/MESECAM: to play a tape recorded in PAL or MESECAM color system
NTSC: to play a tape recorded in NTSC color system



4 Press PLAY ▷.
Playback starts. On-screen information is displayed for some seconds.

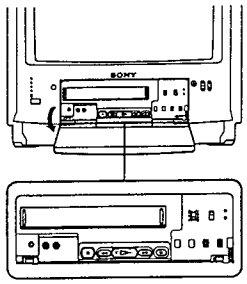
To stop playback
Press STOP ■.
The video TV goes back to the normal TV picture.

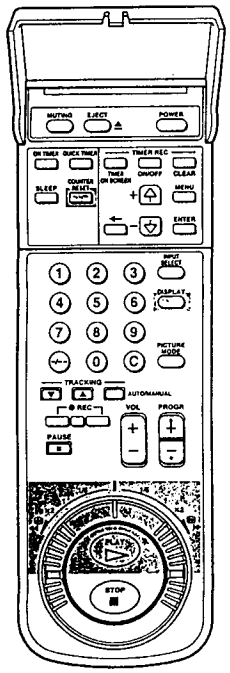
To stop playback for a moment
Press PAUSE ❚❚. The picture pauses.
Press PAUSE ❚❚ again or press PLAY ▷ to resume playback.
If you leave your video TV in pause mode, normal playback resumes after about 5 minutes to protect the quality of video tapes.

To fast forward the tape
Press STOP ■, then turn the DUAL MODE SHUTTLE ring clockwise to ▶▶ and release the ring.
When you use the buttons on the video TV, press STOP ■, then press FF ▶▶.

To rewind the tape
Press STOP ■, then turn the DUAL MODE SHUTTLE ring counterclockwise to ◀◀ and release the ring.
When you use the buttons on the video TV, press STOP ■, then press REW ◀◀.

To start playback automatically after rewinding
Use the DUAL MODE SHUTTLE ring on the Remote Commander. Press PLAY ▷ while turning the ring counterclockwise to ◀◀.



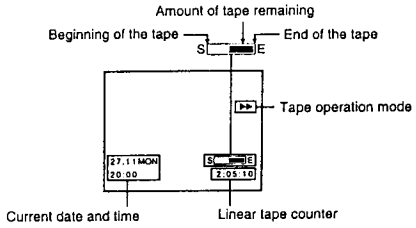


Playing a Tape Repeatedly (Auto Repeat)

You can play the recorded portion of the tape repeatedly.
Set the AUTO REPEAT switch on the video TV to ON, and press PLAY ▷. Playback starts. When the tape reaches the end, the video TV rewinds the tape to the beginning, then plays it.

Displaying the on-Screen Indications

Press DISPLAY to display the following on-screen information. To show only the amount of tape remaining and linear tape counter on the screen, press DISPLAY again.
To make the indications disappear, press DISPLAY until no indications are displayed on the screen.



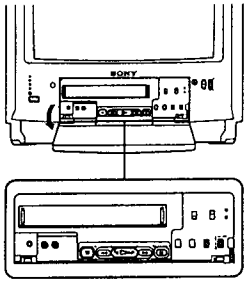
Resetting the Tape Counter

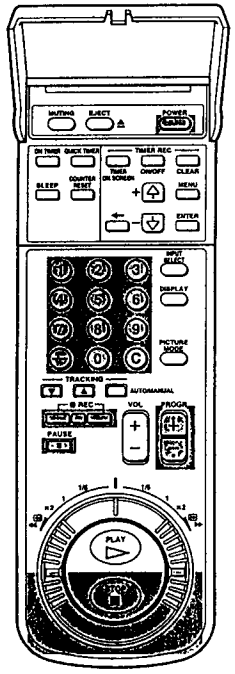
The tape counter helps you to locate a certain scene after playback. Press COUNTER RESET on the Remote Commander to set the counter to "0:00:00" before playing the tape. The tape counter is automatically reset to zero whenever a cassette is inserted. The video TV keeps counting the length of the tape being played. Note, however, that the tape counter does not count the portions without video signals recorded.

Note

The tape operation mode is displayed whenever you change the mode (even when the DISPLAY is turned off).

Recording TV Programs





Recording TV Programs

1 Press POWER on the video TV.
When the STANDBY lamp is lit in red, skip this step.

2 Insert a cassette with a safety tab.

3 Select the program position with PROGR+/–. You can also use number buttons on the Remote Commander. For double-digit numbers (e.g.14), first press -/--, then press 1 and 4.

4 Press REC ●.
When you use the Remote Commander, press two REC ● buttons at the same time.
The REC lamp on the front of the video TV lights up and recording begins.

To stop recording

Press STOP ■.
When the tape reaches the end, the video TV rewinds the tape automatically to the beginning, then stops. This function does not work when the power of the video TV is off.

To pause recording

Press PAUSE ❚❚.
To resume recording, press PAUSE ❚❚ again.

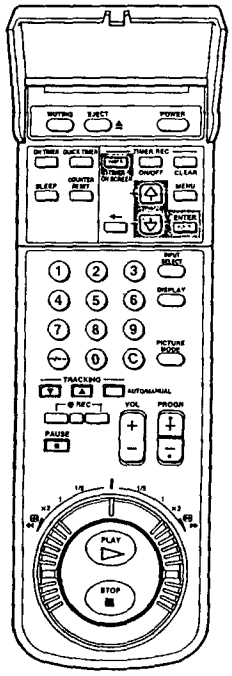
You can cut out an unwanted scene during recording with this button.
1 Press PAUSE ❚❚ when an unwanted scene appears on the screen. Recording pauses.
2 Press PAUSE ❚❚ again to release the pause mode at the desired scene. Recording resumes from the point set in step 1.

When the recording pause mode lasts for about 5 minutes, the video TV stops recording to protect the quality of video tapes.

Recording with the TV Off

Press POWER on the Remote Commander or the video TV.
The video TV is turned off and the STANDBY lamp lights up.
The video TV continues recording.

Recording TV Programs Using the Timer



The Timer Recording function allows you to preset your video TV to record up to six programs within a one-month period.

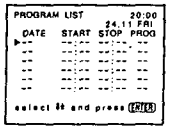
Before you begin

- Switch on the video TV.
- Make sure that the clock is set. If not, the message "Please set the clock" is displayed on the screen. Refer to "Setting the clock" on page 12.
- Make sure that the loaded cassette has its safety tab. If a cassette without safety tab is loaded, the message "Tape with safety tab is required for recording" is displayed.

Setting the Timer

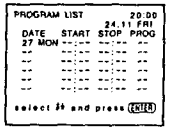
Example: Here is how to record a program broadcast on program position 11 from 20:15 to 21:55 on Monday, 27th November 1995.

1 Press TIMER ON SCREEN.
The PROGRAM LIST appears.

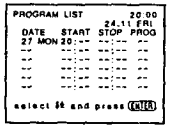


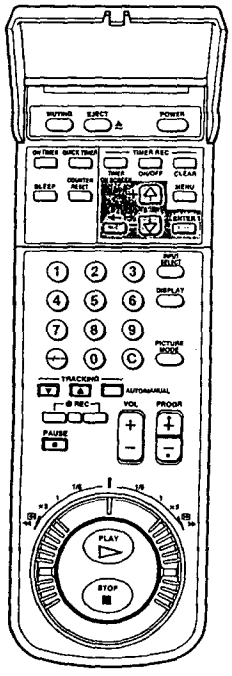
2 Press ENTER.
Today's date colored red appears.

3 Press + ⇧ until "27 MON" appears.
For daily and weekly recording see "Daily and weekly recording" on page 22.

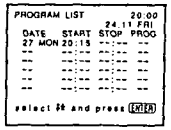


4 Press ENTER, then set the hour of the recording start time to "20" with + ⇧ or – ⇩.

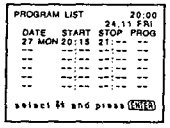




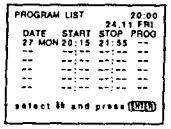
5 Press ENTER, then set the minute of the recording start time to "15" with + ⇧ or – ⇩.



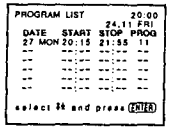
6 Press ENTER, then set the hour of the recording stop time to "21" with + ⇧ or – ⇩.



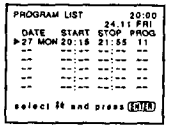
7 Press ENTER, then set the minute of the recording stop time to "55" with + ⇧ or – ⇩.



8 Press ENTER, then set the program position to "11" with + ⇧ or – ⇩.



9 Press ENTER.
The cursor (▶) appears at the left margin.



If you have made a mistake during timer setting

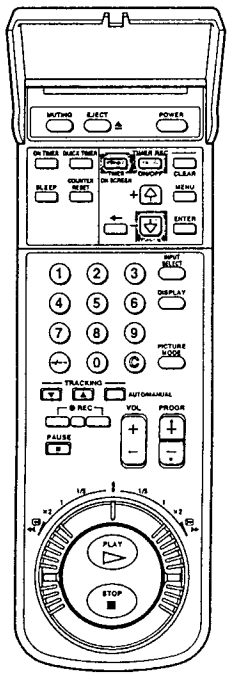
Press ← to go back to the previous position and correct the setting.

If you try to enter the recording start time prior to the current time

All the items of the setting will be erased.

If you try to do incorrect operation

The video TV displays a message on screen to interrupt your setting.



10 When you want to set other programs, press –◇ to move down the cursor to the next column, then repeat steps 2 to 9.

11 Press TIMER REC ON/OFF.
The TIMER REC lamp on the front of the video TV lights up and the video TV enters timer recording standby mode.

Press TIMER ON SCREEN to erase the PROGRAM LIST.
Turn off the video TV if you do not want to watch the TV.
The video TV turns on automatically and starts recording at the preset start time, and goes off at the preset stop time.

Daily/weekly recording

You can preset your video TV to record the same program every day of the week (daily recording) or the same program on the same day every week (weekly recording). Press –◇ in step 3 until the desired setting appears in the "DATE" position. With each press, the setting changes as follows:

24 (today) → MON–SUN → MON–SAT → MON–FRI → EVERY SAT → EVERY FRI → EVERY THU → EVERY WED → EVERY TUE → EVERY MON → EVERY SUN → 23 (next month) → 22.....

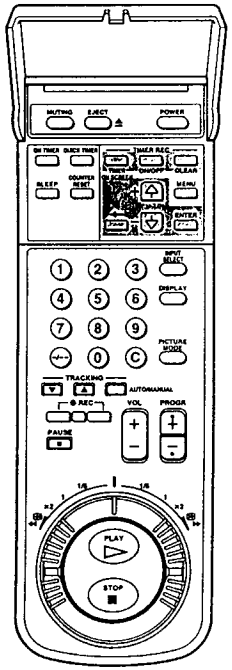
To stop timer recording

Press TIMER REC ON/OFF.

Using the Video TV before Timer Recording Starts

You can watch a TV program, check the timer settings and reset the counter in timer recording standby mode. However, press TIMER REC ON/OFF to turn off the TIMER REC lamp on the front of the video TV to do the following operations:
- ejecting the cassette
- using the tape operation buttons
- changing or canceling the timer settings

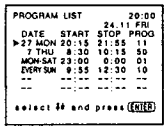
Remember to press TIMER REC ON/OFF again to make the TIMER REC lamp light after the above operations.



Checking the Timer Settings

You can display the list of the timer settings which you preset.

Press TIMER ON SCREEN.
The PROGRAM LIST appears.



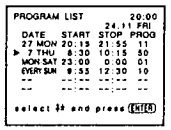
Press TIMER ON SCREEN again to erase the PROGRAM LIST.

Changing or Canceling the Timer Settings

1 Press TIMER REC ON/OFF to turn off the TIMER REC lamp on the front of the video TV.

2 Press TIMER ON SCREEN to display the PROGRAM LIST.

3 Select the setting you want to change or cancel with +◇ or –◇.



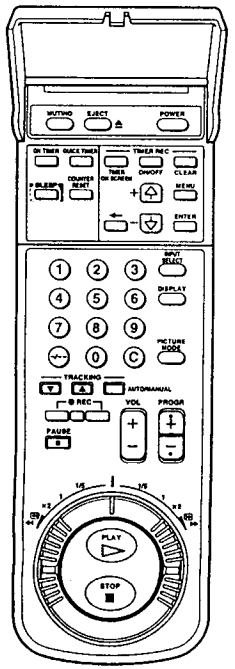
4 **To change the setting**
Using +◇ or –◇ and ENTER, re-enter all the items.
Refer to "Setting the timer" steps 2 to 9 on pages 20 and 21.

To cancel the setting
Press TIMER REC CLEAR.

5 Press TIMER ON SCREEN to go back to the original screen.

6 If there are other timer settings on the list, press TIMER REC ON/OFF to set the video TV to timer recording standby mode.

Switching off Automatically — Sleep Timer



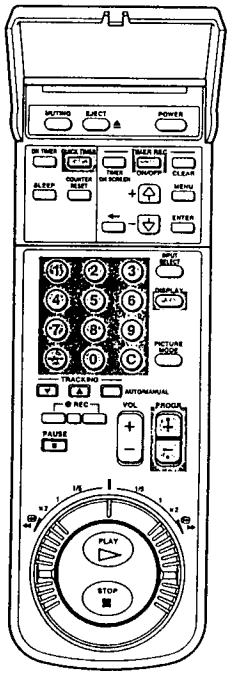
You can automatically switches the video TV into standby mode after a selected time period.

Press SLEEP.
With each press, the time period (in minutes) changes as follows:

OFF → 30 → 60 → 90

One minute before the TV switches into standby mode, a message "Good night" is displayed on the screen.

To cancel the timer
Press SLEEP to select "OFF."



Recording Using the Quick-Timer

You can preset your video TV to start timer recording immediately and to automatically stop recording after a specific time period.

Before you begin
- Switch on the video TV.
- Make sure that the clock is set. If not, the message "Please set the clock" is displayed on the screen. Refer to "Setting the clock" on page 12.
- Make sure that the loaded cassette has its safety tab. If a cassette without safety tab is loaded, the message "Tape with safety tab is required for recording" is displayed.

If you are recording

1 Press QUICK TIMER on the video TV or the Remote Commander.
The "QUICK TIMER 0:00" appears on the screen.

2 Press QUICK TIMER repeatedly to select the recording time period. With each press, the time period changes as follows:

0:00 → 0:30 → 1:00 → .... → 3:30 → 4:00

Even if you switch off the video TV, it continues recording.
After the selected time period has elapsed, recording stops automatically.

If you are not recording

1 Switch on the video TV.

2 Insert a cassette with its safety tab.

3 Select the program position which you want to record.

4 Press QUICK TIMER on the video TV or on the Remote Commander.
The "QUICK TIMER 0:00" appears on the screen.

5 Press QUICK TIMER repeatedly to select the recording time period. With each press the time period changes as follows:

0:00 → 0:30 → 1:00 → .... → 3:30 → 4:00

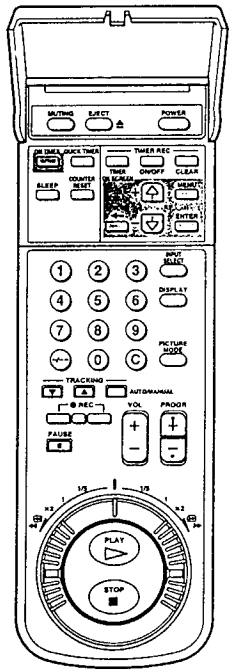
The time period turns yellow and recording starts.
Even if you switch off the video TV, it continues recording.
After the selected time period has elapsed, recording stops automatically.

To change the recording time period after quick-timer recording begins
Press QUICK TIMER until the desired time period appears.

To display the remaining time period during quick-timer recording
Press DISPLAY. The recording time period decreases minute by minute.

To stop quick-timer recording
Press TIMER REC ON/OFF.

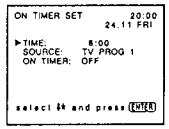
Switching on at Your Desired Time — On Timer



You can preset your video TV to automatically switch on at a desired time. You can select the TV program or video playback to be switched on.

1 Press MENU to display the main menu.

2 Move the cursor to "ON TIMER SET" with +◇ or −◇ and press ENTER.
The ON TIMER SET menu appears.



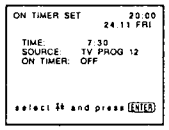
3 Press ENTER.
The timer setting hour section turns red.

4 Set the hour with +◇ or −◇ and press ENTER.
The minute section turns red.

5 Set the minutes (by one minute) with +◇ or −◇ and press ENTER.
The cursor appears beside "TIME."

6 Move the cursor to "SOURCE" with +◇ or −◇ and press ENTER.

7 Select TV or VCR ▶ (video playback) to be switched on with +◇ or −◇ and press ENTER.
When you select TV, select the program position with +◇ or −◇ and press ENTER.



8 Move the cursor to "ON TIMER" with +◇ or −◇ and press ENTER, then select ON with +◇ or −◇ and press ENTER.
The ON TIMER lamp on the front of the video TV lights up.

9 Press MENU to go back to the original screen.
If you are not using the video TV, press POWER on the Remote Commander to set the video TV in standby mode.

At the preset time, the video TV automatically switches on and a message "Good morning" is displayed for five minutes.
If you do not press any button for 2 hours, the video TV automatically shuts off.

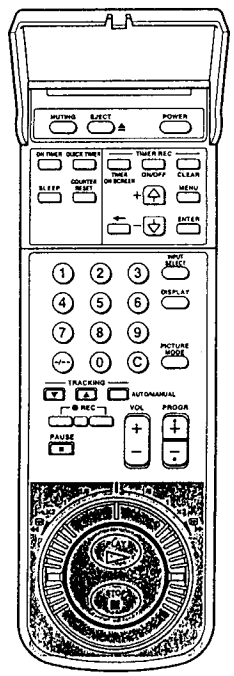
To cancel on timer function

1 Press ON TIMER.
The ON TIMER SET menu appears.
2 Press ON TIMER again to select OFF.

To erase the message

Press any button on the video TV or Remote Commander.

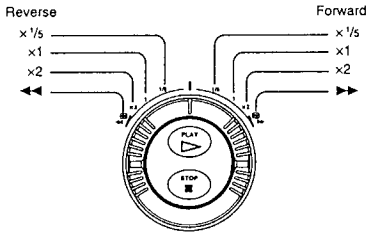
Playing/ Searching a Tape at Various Speeds



You can play a tape at various speeds. It is convenient to locate a desired scene.

Changing the speed and direction of playback using the DUAL MODE SHUTTLE ring on the Remote Commander

During playback or playback pause, turn the ring and hold it. To play forward, turn it clockwise, and turn it counterclockwise to play in reverse. Playback speed is selected according to the turning angle as shown in the illustration below.
You can play a tape at various speeds only with the Remote Commander.



When you release the ring, normal playback or playback pause is resumed.

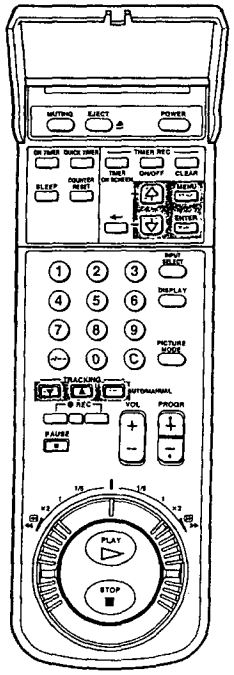
Picture Search

During playback, turn the DUAL MODE SHUTTLE ring on the Remote Commander to ◀◀ (rewind) or ▶▶ (fast forward) and hold it.
A high-speed picture appears on the TV screen.
To resume normal playback, release the DUAL MODE SHUTTLE ring at the desired scene.
When you use the buttons on the video TV, press and hold REW ◀◀ (rewind) or FF ▶▶ (fast forward.) To resume normal playback, release the button.

Viewing the Picture in Fast Forward or Rewind Mode (only with the Remote Commander)

Turn the DUAL MODE SHUTTLE ring on the Remote Commander clockwise to ▶▶ during fast forward or counterclockwise to ◀◀ during rewind.
While you hold the ring, you can view the picture.
When you release the ring, fast forward or rewind mode is resumed.

Enhancing Video Picture Quality



To go back to automatic tracking
Press TRACKING AUTO/MANUAL.

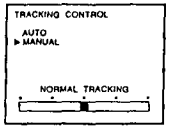
Adjusting the Tracking

Adjusting the Tracking Automatically

The tracking condition is automatically adjusted on this video TV. The AUTO TRACKING indicator will appear while the video TV is searching for best tracking condition.

Adjusting the Tracking Manually

If streaks or snow noise appear on normal playback, slow playback or playback pause picture, press TRACKING ▼ or ▲ in each playback mode to get the best picture. The tracking meter appears on the screen.



Adjusting with the Optimum Picture Control (OPC)

This function allows you to improve playback quality by adjusting the system parameter automatically according to the condition of a video tape.
This function is set to ON at the factory. To maintain better picture quality, it is advisable to leave the function on so that the OPC lamp remains lit. The OPC function works on all types of tapes, even on rental tapes.
To change the setting, use the menu display. Move the cursor to OPC in the main menu, select "OPC ON" or "OPC OFF" with +◇ or −◇ and press ENTER.
When you select "OPC ON," the OPC lamp on the front of the video TV lights up.

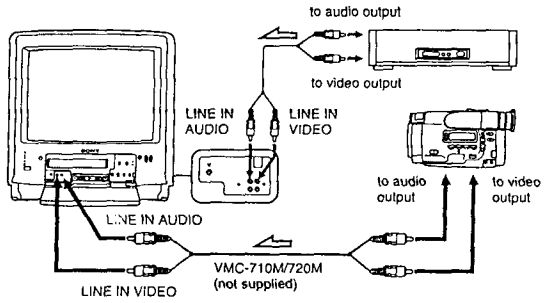
About the Auto Head Cleaner

The auto head cleaner built into this set automatically cleans the video heads when a cassette is loaded or unloaded. If the effect of head cleaning is not sufficient even after a cassette has been loaded/unloaded several times, clean the heads using the Sony V-25CL video head cleaning cassette. For details on head cleaning see page 32.

Connecting Optional Equipment

Watching and Recording the Picture Input from Optional Equipment

To watch the line input signal, press INPUT SELECT so that "LINE" appears on the screen.



Note
Do not use the VTRs connected to the front and rear LINE IN AUDIO/ VIDEO jacks simultaneously.
When you use a VTR, turn off or disconnect another VTR.

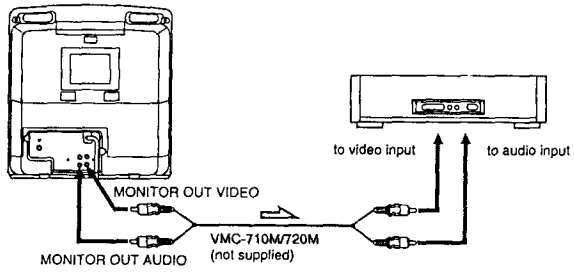
Editing with Another VCR

Using an additional VCR, you can edit a tape.

Editing from another VCR

Connections are the same as in "Watching and recording the picture input from optional equipment."

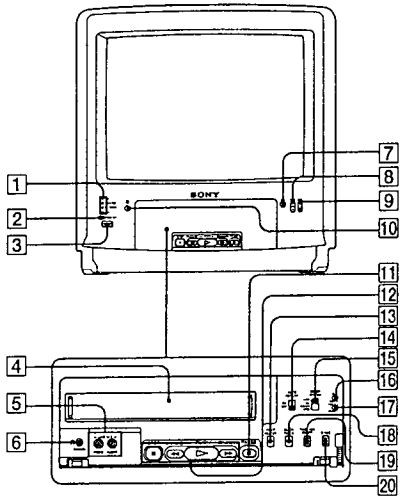
Editing onto another VCR



Index to Parts and Controls

Video TV Set—Front

This section briefly describes the buttons and controls on the video TV set and on the Remote Commander. For more information, refer to the pages next to each description.



[1] Lamps
REC (recording) (page 19)
TIMER REC (recording) (page 22)
ON TIMER (page 26)
OPC (Optimum Picture Control) (page 28)

[2] STANDBY lamp (page 13)

[3] POWER switch (pages 6, 13)

[4] Cassette compartment (page 16)

[5] LINE IN VIDEO/AUDIO jacks (page 29)

[6] ∩ (headphones) jack (page 15)

[7] EJECT ≜ button (page 16)

[8] VOLUME +/– buttons (page 13)

[9] PROGR(program) +/– buttons (page 13)

[10] Remote sensor

[11] PAUSE ❚❚ button (pages 17, 19)

[12] Tape transport buttons (pages 17, 27)

[13] INPUT SELECT button (pages 15, 29)

[14] AUTO REPEAT ON/OFF switch (page 18)

[15] COLOR SYSTEM switch (page 17)

[16] CL (clear) button (page 31)

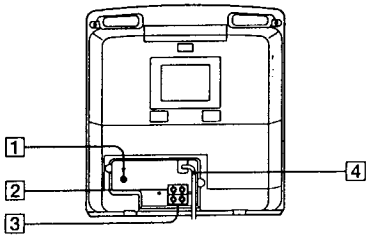
[17] TUNER PRESET ON/OFF button (page 7)

[18] QUICK TIMER button (page 24)

[19] TIMER REC ON/OFF button (pages 22, 23)

[20] REC(recording) ● button (page 19)

Video TV Set–Rear



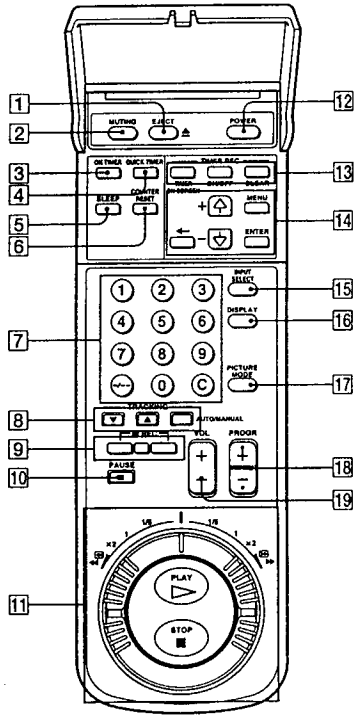
[1] VHF/UHF antenna terminal (page 5)

[2] LINE IN VIDEO/AUDIO jacks (page 29)

[3] MONITOR OUT VIDEO/AUDIO jacks (page 29)

[4] Power cord

Remote Commander



[1] EJECT ≜ button (page 16)

[2] MUTING button (page 14)

[3] ON TIMER button (page 26)

[4] QUICK TIMER button (page 24)

[5] SLEEP button (page 25)

[6] COUNTER RESET button (page 18)

[7] Number buttons (pages 8, 13)

[8] TRACKING ▼/▲/AUTO/MANUAL buttons (page 28)

[9] REC(recording) ● buttons (page 19)

[10] PAUSE ❚❚ button (pages 17, 19)

[11] DUAL MODE SHUTTLE ring (pages 17, 27)

[12] POWER button (pages 6, 13)

[13] TIMER REC buttons
TIMER ON SCREEN (pages 20, 23)
ON/OFF (pages 22, 23)
CLEAR (page 23)

[14] Menu operation buttons (page 6)
MENU
+ ⇧ /– ⇩
←
ENTER

[15] INPUT SELECT button (pages 15, 29)

[16] DISPLAY button (pages 14, 18)

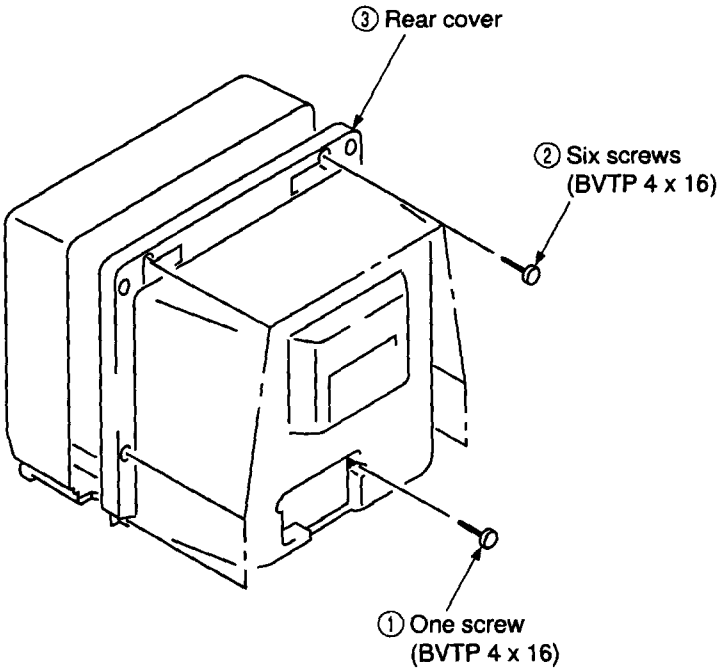
[17] PICTURE MODE button (page 14)

[18] PROGR (program) +/– buttons (page 13)

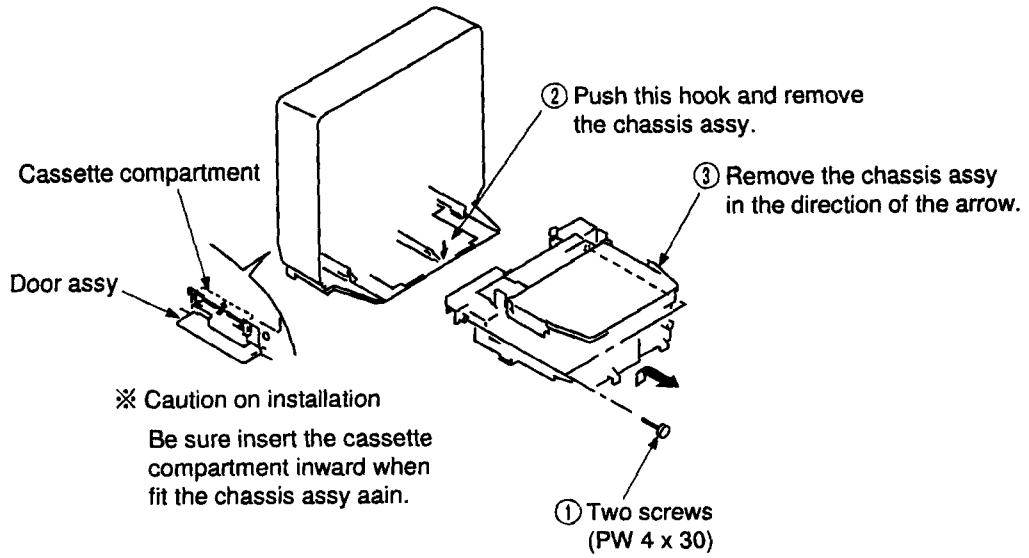
[19] VOL (volume) +/– buttons (page 13)

SECTION 2
DISASSEMBLY

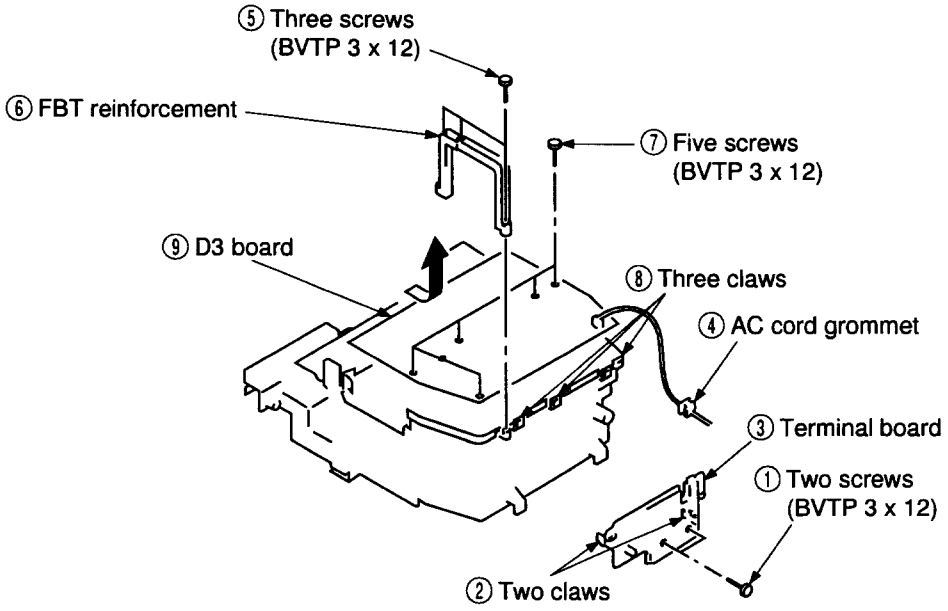
2-1. REAR COVER REMOVAL



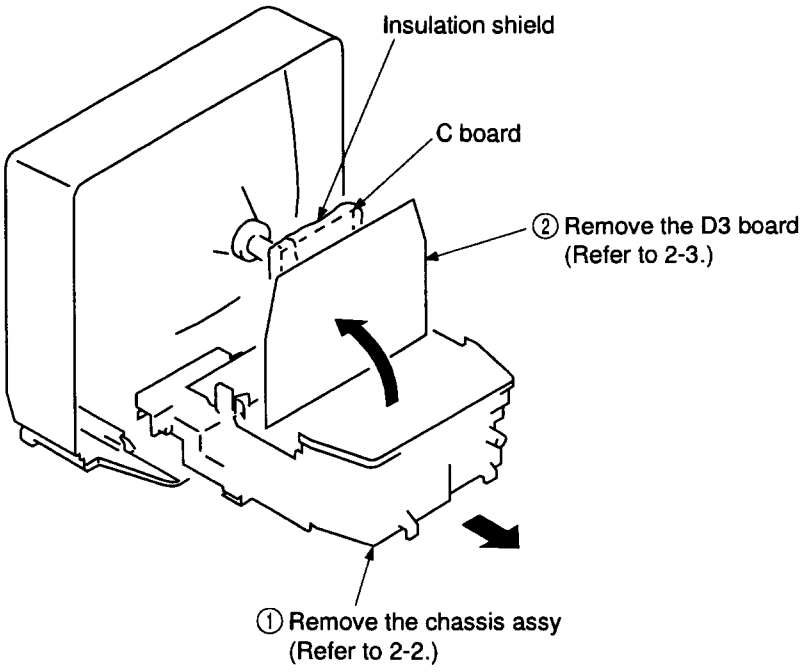
2-2. CHASSIS ASSY REMOVAL


② Push this hook and remove
the chassis assy.
Cassette compartment
③ Remove the chassis assy
in the direction of the arrow.
Door assy
※ Caution on installation
Be sure insert the cassette
compartment inward when
fit the chassis assy aain.
① Two screws
(PW 4 x 30)

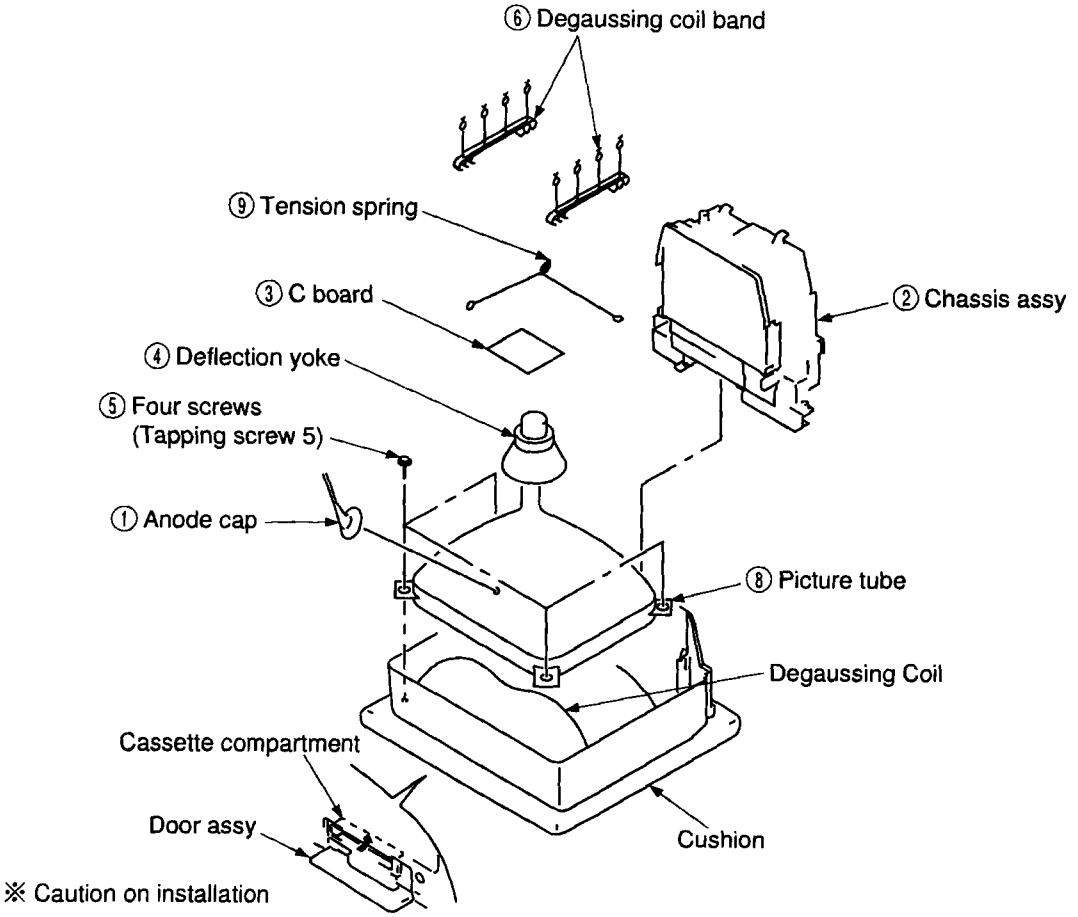
2-3. D3 BOARD REMOVAL



2-4. SERVICE POSITION



2-5. PICTURE TUBE REMOVAL



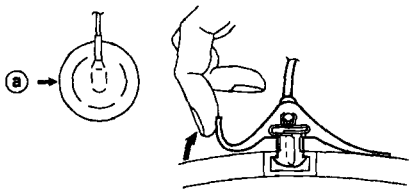
※ Caution on installation

Be sure insert the cassette compartment inward when fit the chassis assy again.

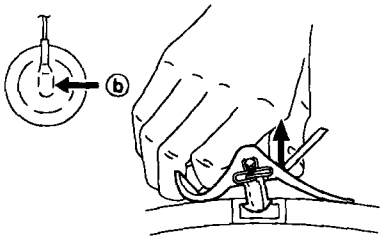
• REMOVAL OF ANODE-CAP

NOTE: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon painted on the CRT, after removing the anode.

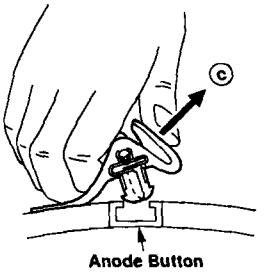
• REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



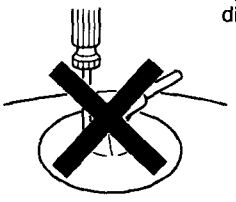
② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.

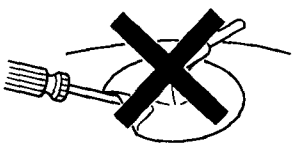


③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

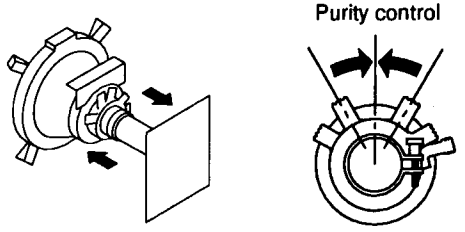
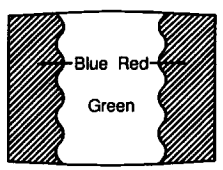
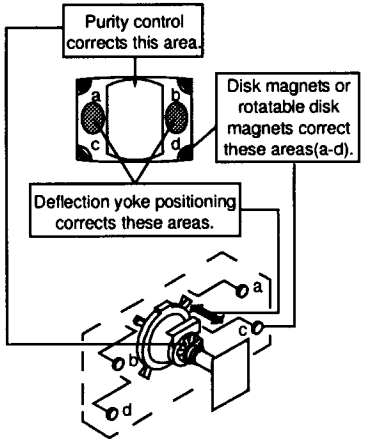
• HOW TO HANDLE AN ANODE-CAP

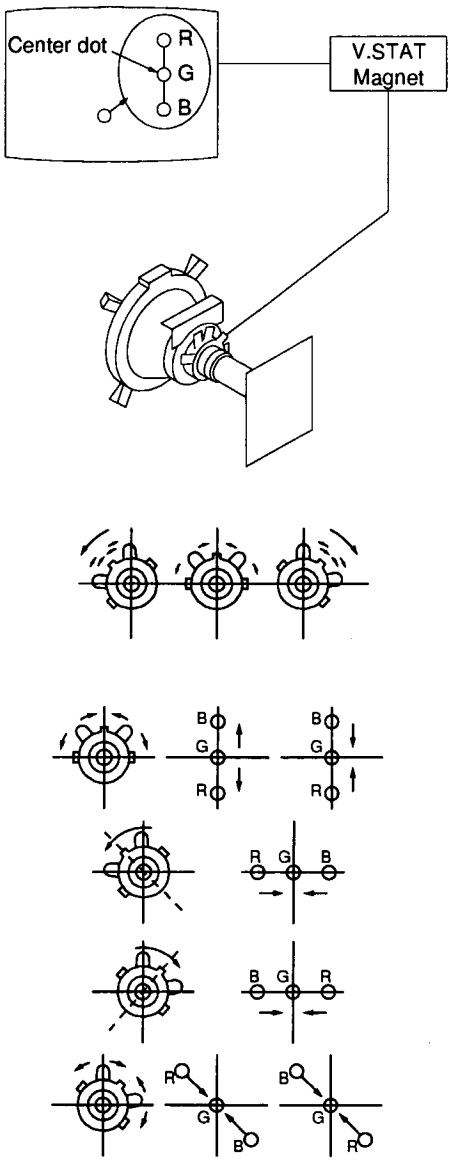
① Don't hurt the surface of anode-caps with shartp shaped material!
② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.
③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.

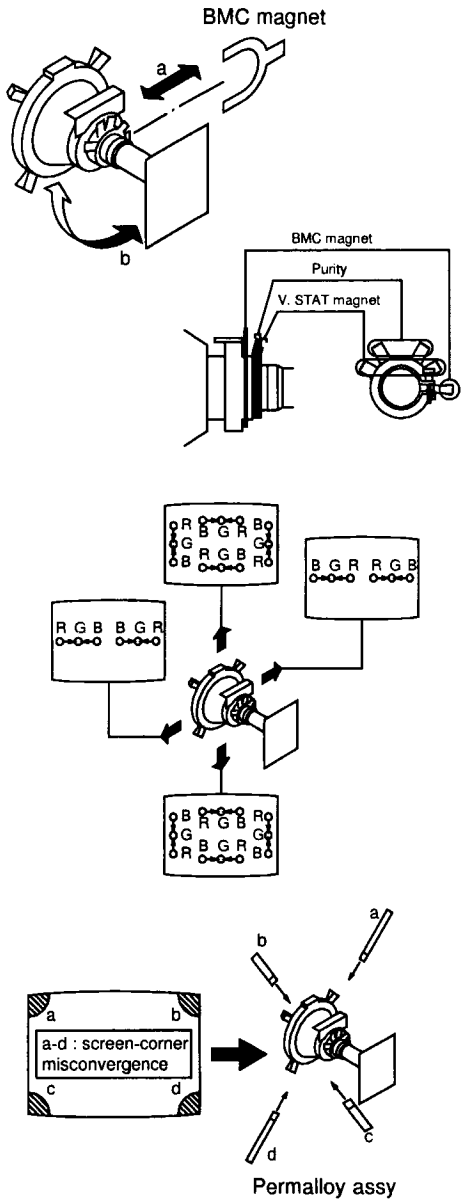


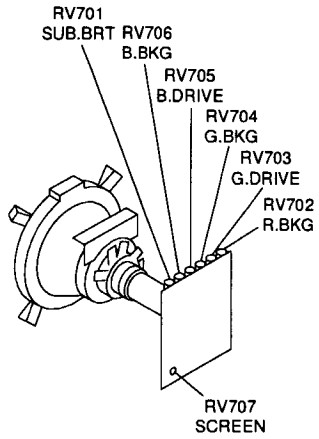
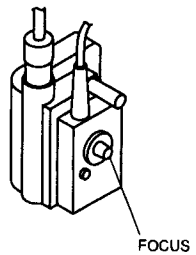


SECTION 3
SET-UP ADJUSTMENTS

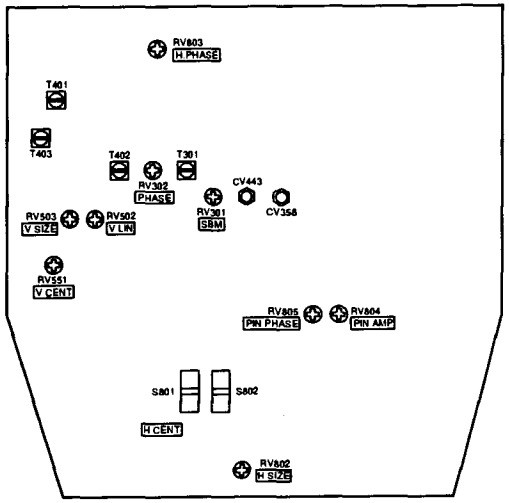
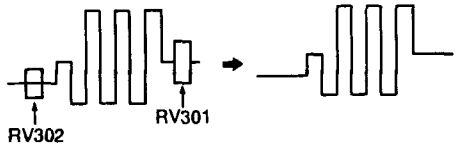
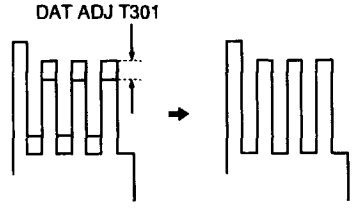
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
● The following adjustments should be made when a complete realignment is required or a new picture tube is installed. ● These adjustments should be performed with rated power supply voltage unless otherwise noted. The controls and switch should be set as follows unless otherwise noted: PICTURE control.....normal, BRIGHTNESS control.....normal **Preparation:** ● Feed in the white pattern signal. ● Before starting, degauss the entire screen.	Degausser		Deflection Yoke Purity magnet	Purity control  Fig.1 Fig.2
3-1. BEAM LANDING 1. Input a raster signal with the pattern generator. 2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown in Fig.2 3. Turn the raster signal of the pattern generator to green. 4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are at the sides evenly. (Fig.3) 5. Move the deflection yoke forward, and adjust so that the entire screen becomes green. (Fig.1) 6. Switch over the raster signal to red and blue and confirm the condition. 7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw. 8. When landing at the corner is not right, adjust by using the disk magnets. (Fig.4)	All white signal Color bar Pattern Generator		Magnet of correction	 Fig.3  Fig.4

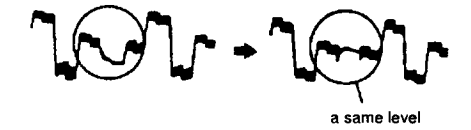
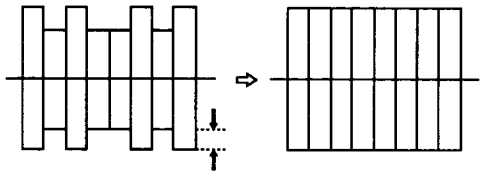
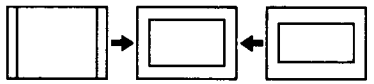
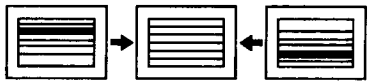
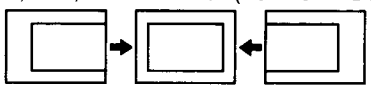
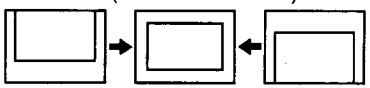
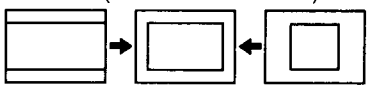
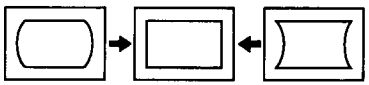
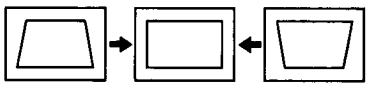
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
3-2. CONVERGENCE **Preparation:** ● Before starting, perform FOCUS, V.LIN and V.SIZE adjustments. ● Set BRIGHTNESS control to minimum. ● Feed in dot pattern. (1) Vertical Static Convergence 1. Adjust V.STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement) ● Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet. 2. When the V.STAT magnet is moved in the direction of arrow ⓐ and ⓑ, red, green and blue dots move as shown below.	Dots signal		BRIGHTNESS ...minimum FOCUS V.LIN V.SIZE V.STAT magnet	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
If the blue dot does not converge with red and green dots, perform following steps. Move BMC magnet (a) to correct insufficient H.static convergence. Rotate BMC magnet (b) to correct insufficient V.static convergence. In either case, repeat Beam Landing Adjustment. (2) Dynamic Convergence Adjustment **Preparation:** ● Before starting perform Horizontal and Vertical static convergence Adjustment. 1. Slightly loosen deflection yoke screw. 2. Remove deflection yoke spacers. 3. Move the deflection yoke for best convergence as shown below. 4. Tighten the deflection yoke screw. 5. Install the deflection yoke spacers. (3) Screen-corner Convergnence	Dots signal		BMC magnet Deflection Yoke	

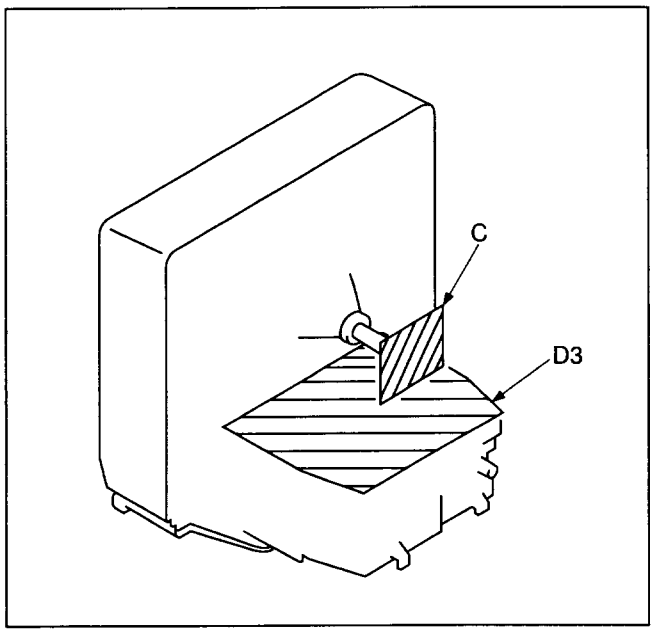
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
3-3. FOCUS Adjust FBT FOCUS control for best picture. **3-4. SCREEN (G2) and WHITE BALANCE** **[SCREEN (G2)]** 1. Input a dots pattarn. 2. Set the PIC, BRT controls at minimum. 3. Supply DC 160 V by equipment into R, G, and B cathode. 4. Adjust RV707 (SCREEN) so that the raster is invisible. **[WHITE BALANCE]** 1. Input a all white signal. 2. Set the PIC control to minimum and set the BRT control at normal. 3. Turn RV 703 (G.DRIVE) and RV 705 (B.DRIVE) fully clockwise. 4. Adjust BKG controls for best white balance. 5. Set the PICTURE control to maximum. Observe the screen and adjust the DRIVE controls for best white balance. 6. Repeat steps 4 and 5.	Broadcasting signal Dots signal Color bar Pattern Generator All white signal		RV703 or FBT (FOCUS control) PIN.BRT ...minimum RV707 (SCREEN) PIC...minimum BRT...normal RV703 (G.DRIVE) RV705 (B.DRIVE) BKG PIC DRIVE	  Flyback transformer assy

SECTION 4
CIRCUIT ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
4-1. D3 BOARD ADJUSTMENTS **A.P.C ADJUSTMENT (CV443) ..... (PAL)** 1. Short circuit between pin ④ and pin ㊼ of IC301 with jumper. 2. Input the PAL color-bar signal. 3. Set the PIC, COL, and BRT controls to normal. 4. Adjust CV443 for suitable color intensity. 5. Remove a jumper.	PAL color-bar signal		PIC, COL, and BRT...normal CV443	D3 BOARD — Component Side — 
A.P.C ADJUSTMENT (CV358) ..... (NTSC) 1. Short circuit between pin ④ and pin ㊼ of IC301 with a jumper. 2. Input NTSC 3.58 color-bar signal. 3. Set the PIC, COL and BRT controls to normal. 4. Adjust CV358 for suitable color intensity. 5. Remove the jumper.	NTSC 3.58 color-bar signal		PIC, COL and BRT...normal CV358	
ANTI PAL, LINE CRAWLING ADJUSTMENT (RV301, RV302, T301) **• ANTI PAL ADJUSTMENT** 1. Input the PAL special color pattern signal. 2. Set the PIC, COL and BRT controls to normal. 3. Connect the oscilloscope to pin ㊲ of IC301. (B OUT) 4. Adjust RV301 (DELAY) and RV302 (PHASE) to obtain the waveform as shown below.	PAL special color pattern signal	pin ㊲ of IC301	PIC, COL and BRT...normal RV301 and RV302	
• LINE CRAWLING ADJUSTMENT 1. Input the PAL color-bar signal. 2. Set the PIC, COL and BRT cntrols to normal. 3. Connect the oscilloscope to pin ㊲ of IC301. 4. Adjust T301 for minimum line crawling.	PAL color-bar signal	pin ㊲ of IC301	PIC, COL and BRT...normal T301	

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
DISCRI ADJUSTMENT (T401, T402) 1. Input the SECAM color-bar signal. 2. Connect the dual-trace oscilloscope to the pin ⑩ (R-Y) and pin ⑪ (B-Y) of IC303. 3. Adjust T402 (R-Y) and T401 (B-Y) as shown the following figure. **BELL FILTER ADJUSTMENT (T403)** 1. Input the SECAM color-bar signal. 2. Connect the oscilloscope to pin ㉔ (OUT) of IC 303. 3. Adjust T403 as shown the following figure.	SECAM color-bar signal SECAM color-bar signal	pin ⑩ and pin ⑪ of IC303 pin ㉔of IC303	T401 (R-Y) T402 (B-Y) T403	  RV503 V.SIZE (VERTICAL SIZE)  RV502 V.LIN (VERTICAL LINEARITY)  S801, S802, RV803 H.PHASE (HORIZONTAL CENTER)  RV551 V.CENT (VERTICAL CENTER)  RV802 H.SIZE (HORIZONTAL CENTER)  RV804 PIN AMP  RV805 PIN PHASE 

5-2. CIRCUIT BOARDS LOCATION (TV SECTION)



VIDEO section

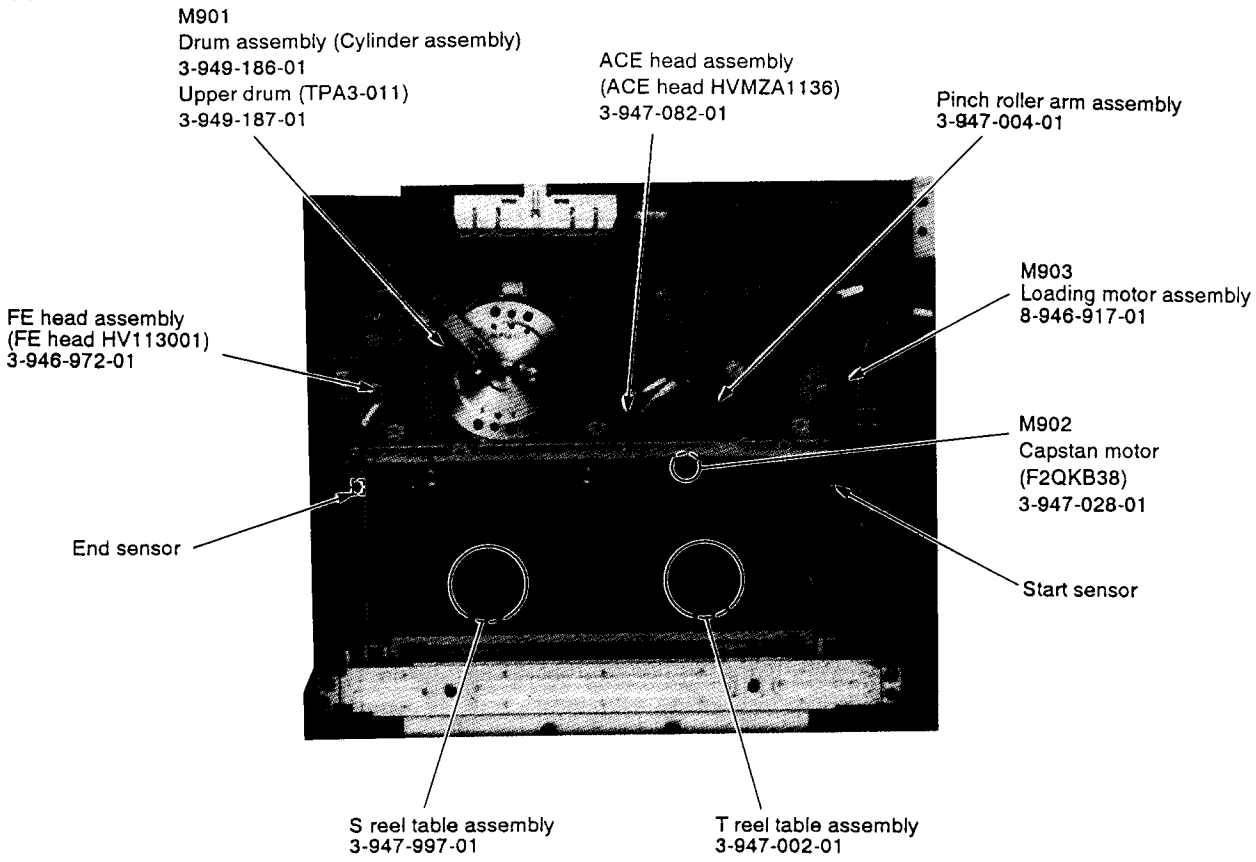
TABLE OF CONTENTS

Section	Title	Page
VIDEO SECTION		
1. GENERAL		
1-1.	Internal Views	45
2. DISASSEMBLY		
2-1.	Service Position	46
2-2.	MF6 and MF7 Boards Removal	46
2-3.	Top Cover and MD Shield Plate Removal	46
2-4.	RP3 Board Removal	47
2-5.	MD Assy Removal	47
2-6.	YC3 Board Removal	47
3. CIRCUIT ADJUSTMENTS		
3-1.	MA3 Board Adjustment	49
3-2.	TK Board Adjustment	50
3-3.	YC3 Board Adjustments	50
3-4.	Audio System Adjustments	53
4. SYSTEM CONTROL INTERFACE		
4-1.	Servo/System Control — Microprocessor Terminal Function	54
4-2.	System Control — Video Block Interface	57
4-3.	System Control — Servo Peripheral Circuit Interface	59
4-4.	System Control — Mechanism Block Interface	61
4-5.	System Control — System Control Periheral Circuit Interface	63
4-6.	System Control — Audio Block Interface	63
5. DIAGRAMS		
5-1.	Block Diagrams (Video Section)	
(1)	VCR Overall Block Diagram	65
(2)	Power Block Diagram	67
(3)	Audio Block Diagram	69
(4)	Servo/System Control Block Diagram	73
(5)	Video Block Diagram	77
5-2.	Frame Schematic Diagram	81
5-3.	Circuit Boards Location (Video Section)	84
5-4.	Schematic Diagrams and Printed Wiring Boards (Video Section)	
(1)	Schematic Diagram of RP3 Board	85
(2)	Schematic Diagrams of MF6, MF7 and TK Boards	91
(3)	Schematic Diagram of YC3 Board	95
(4)	Schematic Diagram of MA3 Board (1/2)	99
(5)	Schematic Diagram of MA3 Board (2/2)	103
5-5.	Semiconductors	
(1)	TV Section	109
(2)	Video Section	110
6. EXPLODED VIEWS (TV SECTION)		
6-1.	Picture Tube	111
6-2.	Main Board Assembly	112
6. EXPLODED VIEWS (VIDEO SECTION)		
6-1.	FL Cassette Compartment Assembly	120
6-2.	Machanism Chassis Assembly 1	121
6-3.	Mechanism Chassis Assembly 2	122
6-4.	Mechanism Chassis Assembly 3	123
6-5.	Mechanism Chassis Assembly 4	124
6-6.	Mechanism Chassis Assembly 5	125
6-7.	Mechanism Chassis Assembly 6	126
7. ELECTRICAL PARTS LIST (TV SECTION)		113
7. ELECTRICAL PARTS LIST (VIDEO SECTION)		127

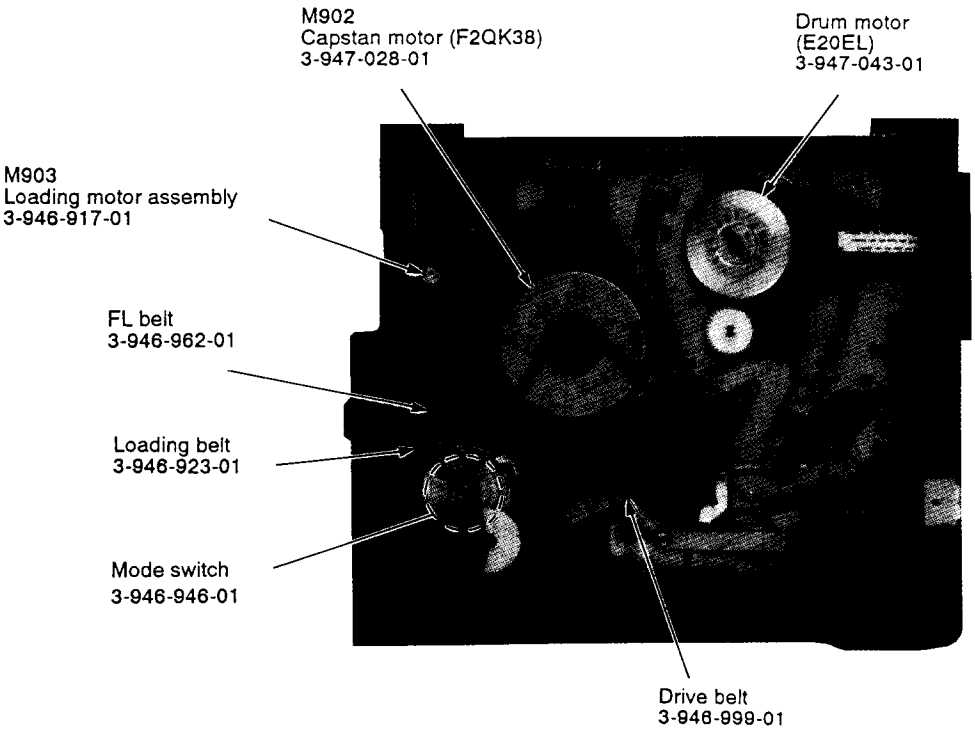
SECTION 1
GENERAL

1-1. INTERNAL VIEWS

– Top Side –

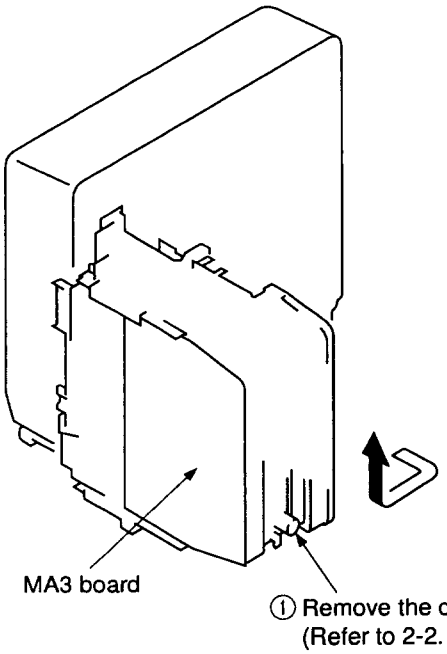


– Bottom Side –

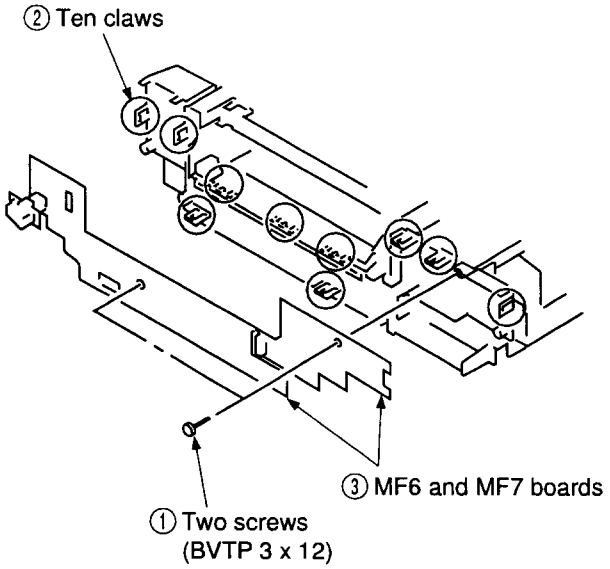


SECTION 2
DISASSEMBLY

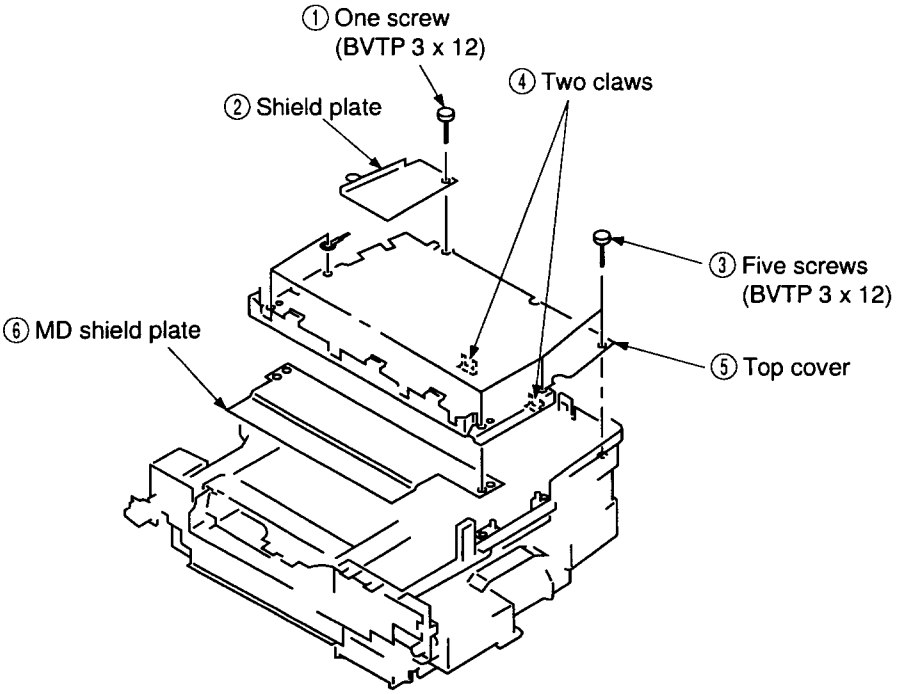
2-1. SERVICE POSITION



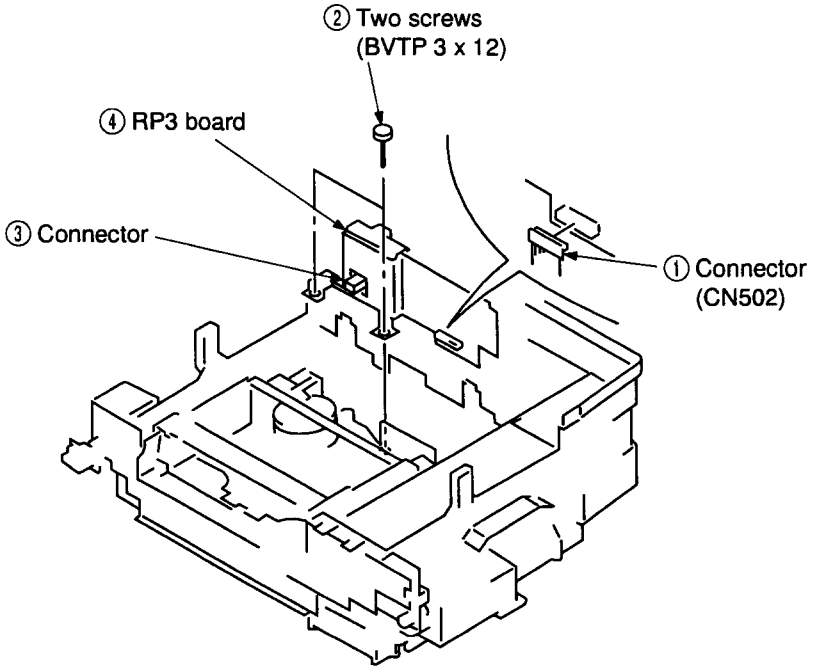
2-2. MF6 AND MF7 BOARDS REMOVAL



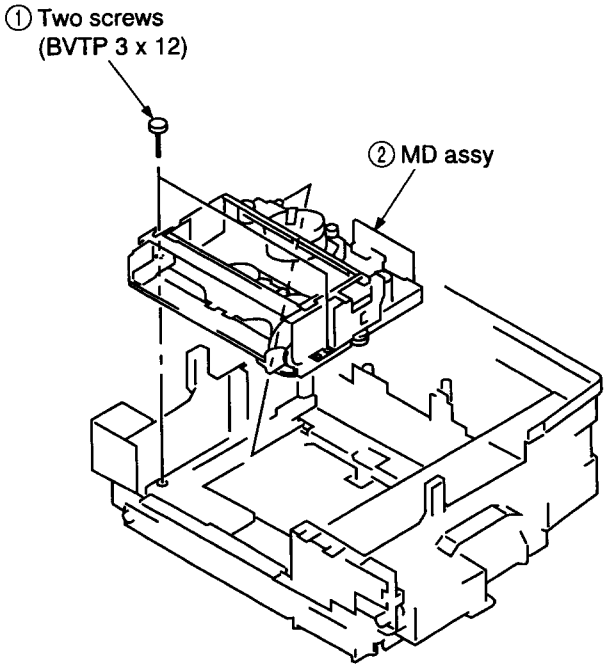
2-3. TOP COVER AND MD SHIELD PLATE REMOVAL



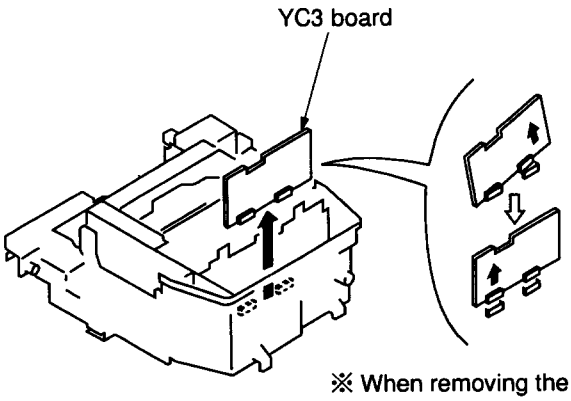
2-4. RP3 BOARD REMOVAL



2-5. MD ASSY REMOVAL



2-6. YC3 BOARD REMOVAL



※ When removing the connector, be sure to pull the one side, then another side.

SECTION 3
CIRCUIT ADJUSTMENTS

Necessary items and indications for total adjustment of electric circuit of this unit will be described in this chapter.

[Instruments to be Used]

1) Color TV
2) Single or dual trace type oscilloscope, band more than 30 MHz, delay mode, as provided.
3) Frequency counter (4 digits or more)
4) PAL pattern generater
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion meter
10) Alignment tape
    Part code : H7099046H (MH-1)

[Connection]

Unless otherwise specified, connect and adjust the measurement equipment as follows.

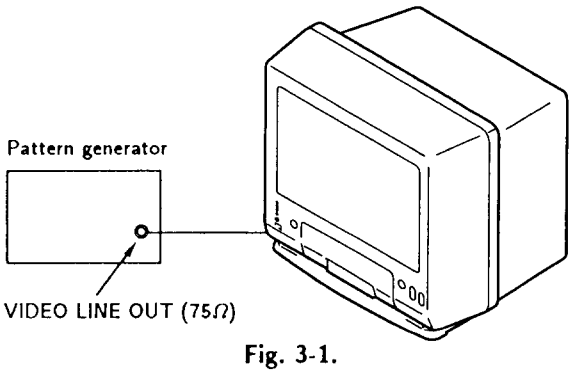


Fig. 3-1.

[Set-up for Adjustment]

The video signal from the pattern generator is used as adjustment signal for electrical adjustment. This video signal should meet the requirement. Connect the oscilloscope to the video input terminal on the MF 1 board and make sure that the amplitudes of sync signal of video signal, video portion and burst signal are flat at approximately 0.3, 0.7 and 0.3V, respectively, and that the level ratio of the burst signal and "red signal"are 0.30 : 0.66, Fig. 7-2. shows video signals (color bars) used in adjusting the electrical adjustment.

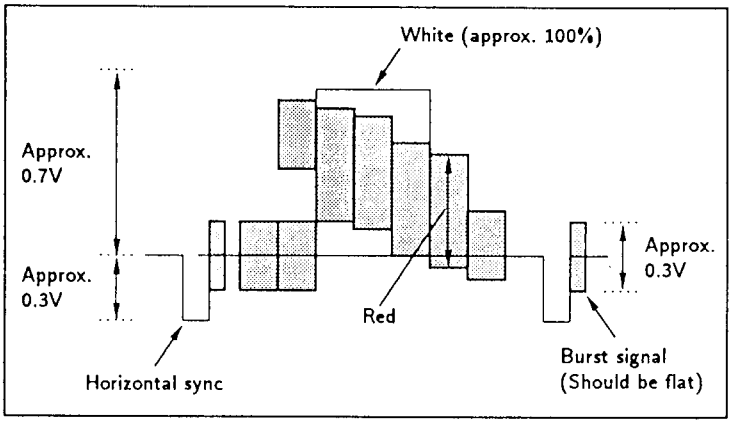


Fig. 3-2. Color bar signal of pattern generator

[Allgnment Tape (MH-1)]

	Mode	Time	Video signal	Audio signal
1	SP	Ten minutes	Stair-step	7 kHz
2		Five minutes	—	3 kHz
3		Ten minutes	Color bar	1 kHz
4		Three minutes	RF sweep	

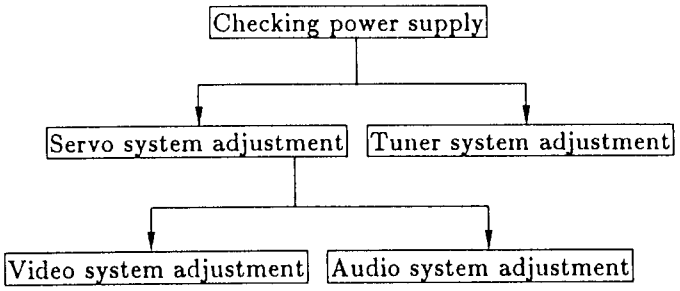
[Specified Input/Output Level Impedance]

Input/Output terminal

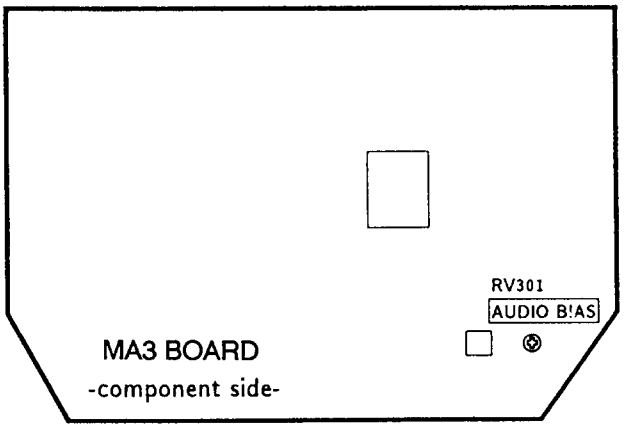
Video input	Pin jack Input signal : 1Vp-p, 75Ω, unbalanced Sync negative
VIDEO LINE OUT	Pin jack Output signal : 1Vp-p, 75Ω, unbalanced Sync negative
AUDIO LINE IN	Pin jack Input level : -7.5dBs (0dBs=0.775Vrms) Input impedance : More than 47kΩ
AUDIO LINE OUT	Pin jack Specified output : -7.5dBs At 47kΩ loaded. Load impedance : More than 10kΩ

[Adjustment Sequence]

Make the electrical adjustment in the following sequences.



3-1. MA3 BOARD ADJUSTMENT



1. CLOCK check

Measurement Point	Pin ③ of IC001
Measurement Euipment	Frequency counter
Spedified Value	$7812.5^{+0.092}_{-0.153}$ (μ sec)

1) Short circuit between pin ③ and GND of IC001.
2) Connect the frequency counter to pin ㉛ of IC001.
3) Make sure that frequency counter is specifications.

2. Recording bias adjustment

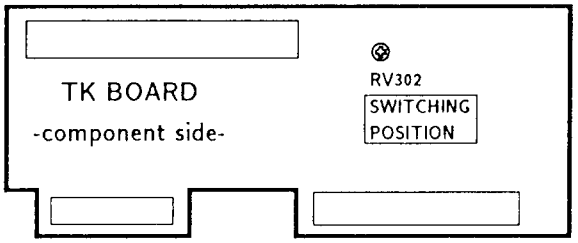
Mode	Recording and playback (SP mode)
Signal	400Hz, -30dBs 7kHz, -30dBs
Measurement Point	AUDIO LINE OUT terminal
Measurement Equipment	Audio level meter
Adjustment Element	RV301
Specified Value	0 ± 2dB

Note : Tape path adustment should have been completed.

Adjustment Method :

1) Input signal of 400 Hz, -30dBs.
2) Make recording.
3) Set the AUDIO LINE IN signal to 7kHz, -30dBs and make recording.
4) Playback a recorded portion and measure output levels at 400Hz and 7kHz.
5) Confirm that the 7kHz playback signal level is within a range of 0±2dB against the 400Hz playback signal level. When beyond this range, adjust RV301 and repeat the steps (1) through (5).

3-2. TK BOARD ADJUSTMENT



SERVO SYSTEM ADJUSTMENT

1. Switching position adjustment (TK board)

Mode	Playback
Signal	Alignment tape, Stair step
Measurement Point	CH1:Pin ⑤ of CN402 (MA3) CH2:Pin ⑤ of CN401 (MA3)
Measurement Equipment	Oscilloscope
Adjustment Element	RV302
Specified Value	416 ± 32μsec (6.5± 0.5H)

Adjustment Method :

1) Press the tracking buttons ⊕ and ⊖ at a time.
2) Adjust for 416 ± 30 μ sec (6.5 ± 0.5) using RV302.

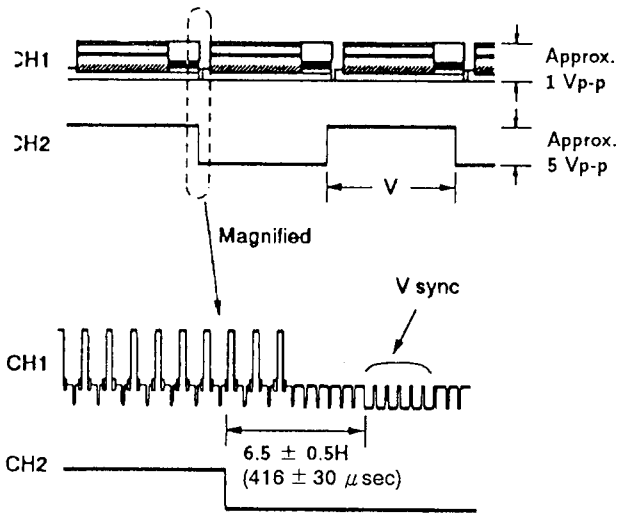
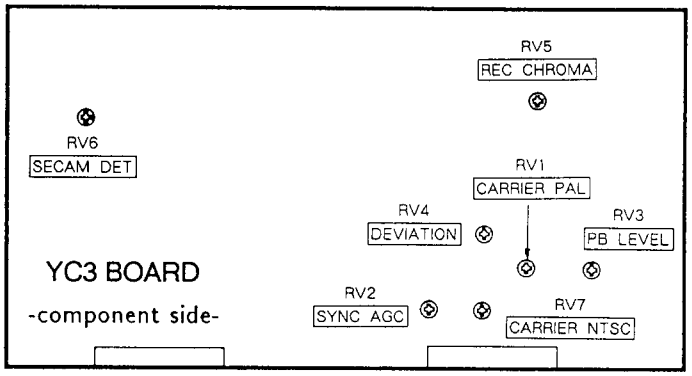


Fig. 3-3. Switching position adjustment

3-3. YC3 BOARD ADJUSTMENTS



Adjust the video system in the following sequences as a rule. The color video signal supplied from the pattern generator is used as a video input signal for video system adjustment in the recording mode. Make sure that sync and color burst signals meet requirements specified at set up of adjustment shown in Fig 3-2.

[Adjustment Sequences]

1) Crystal oscillation frequency confirmation
2) Playback Y signal level adjustment
3) Sync AGC adjustment
4) Sync tip carrier set and deviation adjustment
5) Recording chroma signal level adjustment
6) Y signal recording level check
7) SECAM detector adjustment

1. Crystal oscillation frequency confirmation (YC3 board)

Mode	Playback
Signal	Any tape
Measurement Point	Pin ㉑ of IC001
Measurement Equipment	Frequency counter, Oscilloscope
Specified Value	8.867238MHz ± 120Hz (PAL)

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) of high input impedance (1 MΩ or more) and low capacity (10 pF or less).

Confirmation Method :

1) Make sure that the frequency is 8.867238MHz ± 120 Hz.
2) Make sure that the amplitude is 0.6 ± 0.1 Vp-p.

Fig. 3-4.

2. Playback Y signal level adjustment (YC3 board)

Mode	Playback
Signal	MOD Signal (color bar)
Measurement Point	VIDEO OUT
Measurement Equipment	Oscilloscope
Adjustment Element	RV003
Specified Value	1.00 ± 0.05 Vp-p

Note : Make this adjustment RENTAL PICTURE OFF condition.

Adjustment Method :

1) Adjust for 1.00 ± 0.05 Vp-p using RV003.

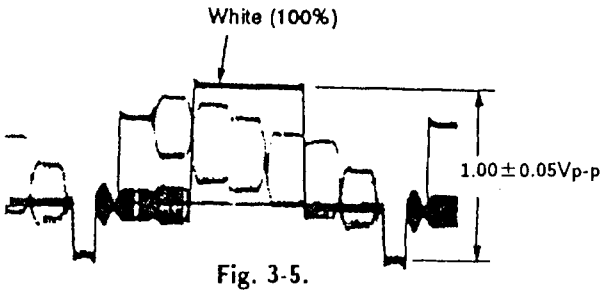


Fig. 3-5.

3. Sync AGC adjustment (YC3 board)

Mode	Recording or EE
Signal	Color bar
Measurement Point	VIDEO OUT
Measurement Equipment	Oscilloscope
Adjustment Element	RV002
Specified Value	1.00 ± 0.05 Vp-p

Adjustment Method :

1) Adjust for 1.00 ± 0.05 Vp-p using RV003.

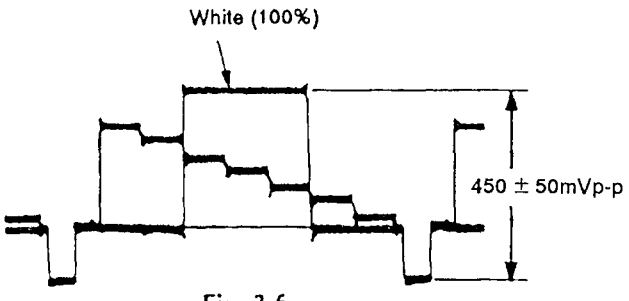


Fig. 3-6.

4. Sync tip carrier set and deviation adjustment (YC3 board)

Before starting this adjustment, be sure to check that "2. playback Y signal level adjustment" has been completed.

Sync tip carrier set adjustment	
Mode	E-E
Signal	Color bar (PAL, NTSC)
Measurement Point	Pin ③ of IC001 (REC Y)
Measurement Equipment	Spectrum Analyzer
Adjustment Element	RV001 (PAL), RV007 (NTSC)
Specified Value	3.80 ± 0.05 MHz (PAL) 3.45 ± 0.05 MHz (NTSC)
Deviation adjustment (PAL only)	
Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑩ of CN001 (REC Y)
Measurement Euipment	Spectrum Analyzer
Adjustment Element	RV004
Specified Value	3.80 ± 0.05 MHz (PAL)

Note: Make this adjustment RENTAL PICTURE OFF condition.

Adjustment Method :

4-1. PAL

1) Input the PAL color bar signal to make recording, and select the E-E mode.
2) Connect the frequency counter to the Pin ⑩ of CN001 and adjust for 3.80 ± 0.05 MHz using RV001.
3) If does not meet the specification, repeat 1) to 2) after adjusting RV001 and RV004.

4-2. NTSC

1) Input the NTSC color bar signal to make recording, and select the E-E mode.
2) Connect the frequency counter to the Pin ⑩ of CN001 and adjust for 3.45 ± 0.05 MHz using RV007.

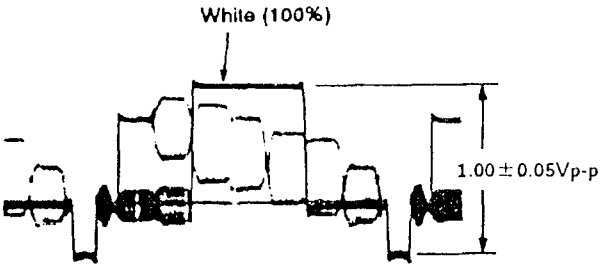


Fig. 3-7.

5. Recording chroma signal level adjustment (YC3 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ① of CN001 (REC C)
Measurement Equipment	Oscilloscope
Adjustment Element	RV005
Specified Value	120 ± 5 mVp-p

Adjustment Method :

1) Adjust the color bar "red" level to 120 ± 5 mVp-p using RV005.

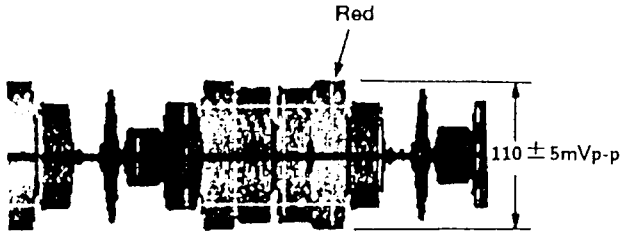


Fig. 3-8.

6. Y signal recording level adjustment (YC3 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑩ of CN001 (Y REC)
Measurement Equipment	Oscilloscope
Specified Value	450 ± 50 mVp-p

Adjustment Method :

1) Confirm that the REC Y level is 450 ± 50 mVp-p.

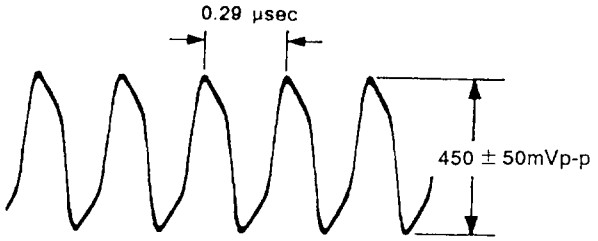


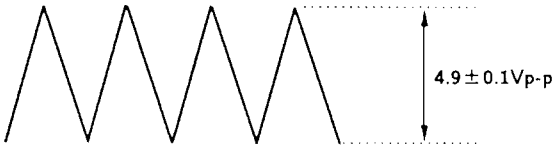
Fig. 3-9.

7. SECAM detector adjustment (YC3 board)

Mode	E-E
Signal	SECAM color bar
Measurement Point	Pin ⑪ of IC004
Measurement Equipment	Oscilloscope
Adjustment Element	RV006
Specified Value	4.9 ± 0.1Vp-p

Adjustment Method :

1) Adjust the level to 4.9 ± 0.1 Vp-p using RV006.



3-4. AUDIO SYSTEM ADJUSTMENTS

[Connection]

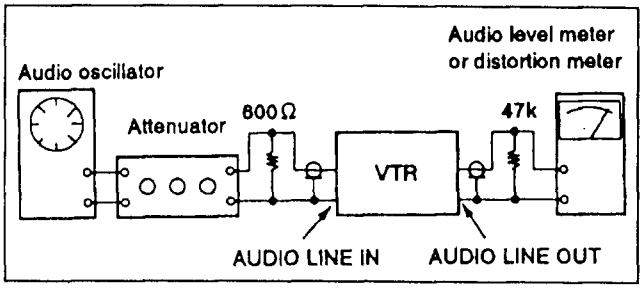


Fig. 3-10.

- Make adjustment in the SP mode.
  Color System SW is changed to PAL mode.

[Adjustment Sequences]

1) ACE head adjustment
   ... See "VHS MECHANICAL ADJUSTMENT MANUAL Ⅲ".
2) Playback output level check
3) E-E output level check
4) Recording bias adjustment
5) Overall level characteristic and distortion factor check.
6) Overall S/N check

1. ACE head adjustment

See "VHS MECHANICAL ADJUSTMENT MANUAL Ⅲ".

2. Playback output level check

Mode	Playback
Signal	Alignment tape, 1 kHz (color bar) portion
Measurement Point	AUDIO LINE OUT terminal
Measurement Equipment	Audio level meter
Specified Value	-7.5 ± 2dBs

Confirmation Method :

1) Playback 1kHz portion and make sure that AUDIO LINE OUT signal level is -7.5 ± 2dBs.

3. E-E output level check

Mode	E-E
Signal	400Hz, -7.5 dBs
Measurement Point	AUDIO LINE OUT terminal
Measurement Equipment	Audio level meter
Specified Value	-7.5 ± 3dBs

Confirmation Method :

1) Input signal of 400 Hz, -7.5 dBs to AUDIO LINE IN.
2) Make sure that AUDIO LINE OUT signal level is -7.5 ± 3dBs.

4. Overall level characteristic and distortion factor check

Mode	Recording and playback (SP mode)
Signal	400Hz, -7.5dBs
Measurement Point	AUDIO LINE OUT terminal
Measurement Equipment	Audio level meter and distortion meter
Specified Value	Playback level : -7.5 ± 3dBs Distortion factor : 4% or less

Confirmation Method :

1) Input audio signal of 400Hz, -7.5 dBs to AUDIO LINE IN.
2) Make recording.
3) Playback the recorded portion.
4) Make sure that playback level is -7.5 ± 3dBs.
5) Make sure that distortion factor is within 4%.

5. Over S/N check

Mode	Recording and playback (SP mode)
Signal	No signal
Measurement Point	AUDIO LINE OUT terminal
Measurement Equipment	Audio level meter
Specified Value	Less than −40 dBs

Confirmation Method :

1) Make no signal input.
2) Make recording.
3) Playback the recorded portion.
4) Confirm that the noise level is less than −40 dBs.

SECTION 4
SYSTEM CONTROL INTERFACE

4-1. SERVO/SYSTEM CONTROL–MICROPROCESSOR TERMINAL FUNCTION (MA3 BOARD IC501)

Pin. No.	Port	I/O	Name	Function
1	PB5/PPO13	O	RF SWP	Video switching pulse output.
2	PB4/PPO12	O	Q VD	Quasi VD pulse output.
3	PB3/PPO11	O	Q HD ENABLE	Quasi HD control.
4	PB2	O	AF REC	Not used.
5	PB1	O	REC P	"H" output when video REC (REC control).
6	PB0	O	REC	"H" output when REC.
7	PC7	O	REC CTL	REC CTL output.
8	PC6	O	INT VD	Not used.
9	PC5	O	PB	Not used.
10	PC4	O	$\overline{SP}$	"L" when SP mode.
11	PC3	O	LP	"H" when LP mode.
12	PC2	O	Env GAIN	"H" when LP mode.
13	PC1	O	$\overline{JOG}$	"L" when special playback.
14	PC0	O	STEP PLS	STEP PLS Output.
15	PJ7	O	SYSTEM 2	Not used.
16	PJ6	O	$\overline{H\ DET}$	
17	PJ5	O	NTSC PB	"H" when NTSC playback.
18	PJ4	O	Edit	"H" when Edit.
19	PJ3	O	S Reel FG	S Reel sensor input. TSC, "L" when special playback on PAL-M.
20	PJ2	O	T Reel FG	T Reel sensor input.
21	PJ1	O	RENTAL	"H" when RENTAL PICTURE.
22	PJ0	O	AMS	Not used.
23	PD7	I	C-OUT	Cassette switch input.
24	PD6	I	C-START	
25	PD5	I	C-IN	
26	PD4	I	REC SAF	Erasing protection tab detection.
27	PD3	O	E TAPE	"H" when E TAPE mode.
28	PD2	O	$\overline{TV}$/VTR	Not used.
29	PD1	O	LINE SEL 1	Not used.
30	PD0	O	LINE SEL 2	Not used.
31	PH7	O	TA MUTE	Not used.
32	PH6	O	PAL	
33	PH5	O	AMS Mute	
34	PH4	O	ORC ON	
35	PH3	O	CAP TRQ 1	Current drive capstan motor control.
36	PH2	O	CAP TRQ 2	
37	PH1	O	LAMP	End sensor lamp drive output.
38	PH0	O	$\overline{CAP\ STOP}$	Capstan STOP signal output.
39	MP	I	MP	Fixed "L" level.
40	$\overline{RST}$	I	$\overline{COSMO\ RST}$	System reset input.
41	Vss		Vss	GND
42	XTAL	O	XTAL	System clock 12 MHz.
43	EXTAL	I	EXTAL	
44	$\overline{CS0}$	O	$\overline{COSMO\ CS}$	Chip select signal.
45	SI0	I	S IN	Signal for serial communication.

Pin.No.	Port	I/O	Name	Function
46	$\overline{SO0}$	O	S OUT 0	Signal for serial communication.
47	SCK0	O	$\overline{SCLK\ 0}$	Clock for serial communication.
48	PF7/AN11	I	K Mode	Not used.
49	PF6/AN10	O	AFT UP	Not used.
50	PF5/AN9	I	DEST	Destination selection.
51	PF4/AN8	I	AF SW POSI	Not used.
52	AVss		AVss	UNSW GND.
53	AVREF		AVREF	AD port reference input. UNSW 5V.
54	AVDD		AVDD	UNSW 5V.
55	PF3/AF7	I	MODE4	Mechanism section CAM encoder input.
56	PF2/AN6	I	MODE3	
57	PF1/AN5	I	MODE2	
58	PF0/AN4	I	MODE1	
59	AN3	I	DEW	DEW sensor analog input.
60	AN2	I	VIDEO RF	Video RF envelope input.
61	AN1	I	AF ENV	Not used.
62	AN0	I	SW POSI	VR input for RF SWP adjustment.
63	PG7	I	T SENSOR	Take-up side end sensor input.
64	PG6	I	S SENSOR	Supply side end sensor input.
65	PG5	I	N.C.	Not used.
66	PG4/SYNC	I	V SYNC	Composite sync input.
67	PG3/$\overline{PBCTL}$	I	$\overline{PB\ CTL}$	Playback CTL input.
68	PG2/DPG	I	DRM PG	Drum PG input.
69	PG1/DFG	I	DRM FG	Drum FG input.
70	PG0/CFG	I	CAP FG	Capstan FG input.
71	PE7	O	STEP PULS	"L" when capstan STEP is driven.
72	PE6	O	CAP RVS	Capstan reverse signal output.
73	PE5	O	CAP DA	Capstan error D/A output.
74	PE4	O	DRUM DA	Drum error D/A output.
75	PE3	O	MEM CS	EEPROM chip select.
76	PE2	O	STEP DRIVE	CTL amp step action control.
77	PE1	I	VD CTL	Playback CTL input.
78	PE0		N.C.	Not used.
79	SI1	I	AFT Dwn	
80	SO1	O	S OUT 1	
81	$\overline{SCK1}$		$\overline{SCK\ 1}$	
82	PI4	O	AFT UP	Not used.
83	PI3	O	$\overline{HiFi}$	Not used.
84	PI2/$\overline{\ }$PWM	O	STEREO	Not used.
85	PI1/RMC	O	HEAD CONT	Head amp IC control.
86	TEX	I	N.C.	Not used.
87	TX		N.C.	Not used.
88	Vss		Vss	GND
89	VDD		VDD	UNSW 5V.
90	N.C.		N.C.	Not used.

Pin No.	Port	I/O	Name	Function
91	PA7	O	CAM M	Loading motor control.
92	PA6	O	CAM P	
93	PA5	O	NA REC P	Normal audio bias oscillation ON/OFF.
94	PA4	O	NA PB	"H" when audio playback.
95	PA3	O	A MUTE	Audio muting output. "H": muting.
96	PA2	O	$\overline{\text{V-PB}}$	"L" when video playback.
97	PA1	O	OSD Black	Not used.
98	PA0	O	CTL INDEX	Not used.
99	PB7	O	AF PB	Not used.
100	PB6/PPO14	I	AF SWP	Not used.

I-2. SYSTEMM CONTROL–VIDEO BLOCK INTERFACE (MA3 BOARD IC501)

Signal	Pin. No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UN-LOADING	PB	PB-PAUSE	SLOW	×2	CUE	REVIEW	REC	REC-PAUSE
$\overline{\text{V-PB}}$	MA3 Board IC501 ⑯	O	H	H	H	L	L	L	L	L	L	H	H
HEAD CONT	MA3 Board IC501 ⑮	O	L	L	L	L	H	*1	H	L	L	H	L
RF SW P.	MA3 Board IC501 ①	O	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Q VD	MA3 Board IC501 ②	O	L	L	L	*3	*4	*4	*4	*4	*4	L	L
$\overline{\text{SP}}$	MA3 Board IC501 ⑩	O	*5	*5	*5	*6	*6	*6	*6	*6	*6	*5	*5
LP	MA3 Board IC501 ⑪	O	*5	*5	*5	*6	*6	*6	*6	*6	*6	*5	*5
REC. P	MA3 Board IC501 ⑤	O	L	L	L	L	L	L	L	L	L	L	H
REC	MA3 Board IC501 ⑥	O	L	L	L	L	L	L	L	L	L	L	H
V SYNC	MA3 Board IC501 ⑯	I	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. "H" when tape stops. "L" when tape runs (approx. for 40 msec).
*2. Synchronized with drum rotation. 30 Hz 50% duty pulse.
*3. Normally "L". "H" when video signal is not generated.
*4. V period "H" pulse.
*5. Selected by SP/EP. SP mode: "L", EP mode: "H".
*6. Selected by tape recording mode.

sig/mod	SP	LP
SP (10)	L	H
LP (11)	L	H

*7. Composite sync signal (positive).
*8. "H" when menu screen or blue back screen.

4-3. SYSTEM CONTROL–SERVO PERIPHERAL CIRCUIT INTERFACE (MA3 BOARD IC501)

Signal	Pin. No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UN-THREAD-ING	PB	PB-PAUSE	SLOW	×2	CUE	REVIEW	REC	REC-PAUSE
REC CTL	MA3 Board IC501 ⑦	O	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*1	*14
STEP PLS	MA3 Board IC501 ⑭	O	L	*2	*2	*2	*2	*2	L	*3	*2	*2	*2	*2	L
SW POSITION *4	MA3 Board IC501 ⑫	I													
$\overline{\text{PB CTL}}$	MA3 Board IC501 ⑰	I	H	*5	*5			*1	H/L	*3	*5	*5	*5	*1	H
VD CTL	MA3 Board IC501 ⑰	I	H	*5	*5			*1	H/L	*3	*5	*5	*5	*1	H
DRUM PG	MA3 Board IC501 ⑱	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
DRUM FG	MA3 Board IC501 ⑲	I	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	MA3 Board IC501 ⑳	I	H/L	*8	*8	*9	*9	*8	H/L	*10	*8	*8	*8	*8	H/L
CAP RVS	MA3 Board IC501 ㉒	O	H/L	L	H	L	H	L	L	*3	L	L	H	L	L
CAP DA *14	MA3 Board IC501 ㉓	O	*11	*11	*11	*11	*11	*12	*11	*11	*12	*12	*12	*12	*11
DRUM DA *14	MA3 Board IC501 ㉔	O	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13
STEP DRIVE	MA3 Board IC501 ㉖	O	L	L	L	L	L	L	L	*15	L	L	L	L	L

*1. 30 Hz pulse.
*2. 3 value output of "H", "L" and Hi-Z (2.5V).
*3. Unstable period Pulse.
*4. Input terminal for video switching position adjustment.
*5. Pulse of period in proportion to tape speed.
*6. 30 Hz "H" pulse.
*7. 720 Hz pulse.
*8. Pulse of period in proportion to tape speed.
*9. Unstable period pulse.
*10. Pulse at tape running.
*11. Approx. 2 msec period "H" or "L" pulse.
*12. Approx. 1.5 msec period "H" or "L" pulse.
*13. Approx. 3 msec period "H" or "L" pulse.
*14. HI-Z (2.5V).
*15. "H" when FWD direction and STEP drive.

4-4. SYSTEM CONTROL–MECHANISM BLOCK INTERFACE (MA3 BOARD IC501)

Signal	Pin. No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOAD-ING	TAPE THREAD-ING	TAPE UN-THREAD-ING	STOP	FF	REW	PB	PB-PAUSE	SLOW	×2	CUE	REVIEW	REC	REC-PAUSE
LOAD (–)	MA3 Board IC501 ⑨①	O	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L
LOAD (+)	MA3 Board IC501 ⑨②	O	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L
MODE1	MA3 Board IC501 ⑤⑧	I	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H
MODE2	MA3 Board IC501 ⑤⑦	I	L	H	L	L	H	L	L	L	L	H	H	L	L	L	L	H
MODE3	MA3 Board IC501 ⑤⑥	I	H	H	H	L	H	H	H	H	L	L	L	L	L	L	L	L
MODE4	MA3 Board IC501 ⑤④	I	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
C-OUT	MA3 Board IC501 ② ③	I	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
C-START	MA3 Board IC501 ② ④	I	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H
C-IN	MA3 Board IC501 ② ⑤	I	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
REC SAF	MA3 Board IC501 ② ⑧	I	L	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
T REEL	MA3 Board IC501 ② ⓪	I	H/L	H/L	H/L	H/L	H/L	H/L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
S REEL	MA3 Board IC501 ① ⑨	I	H/L	H/L	H/L	*2	*2	H/L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
LAMP	MA3 Board IC501 ③⑦	O	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
CAP TRQ1	MA3 Board IC501 ③⑤	O	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP TRQ2	MA3 Board IC501 ③⑥	O	H	H	H	H	H	H	H	H	H	H	*4	H	H	H	H	H
$\overline{\text{CAP STOP}}$	MA3 Board IC501 ③⑧	O	L	*5	*5	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
T SENS	MA3 Board IC501 ⑥③	I	*3	*3	*3	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA3 Board IC501 ⑥④	I	*3	*3	*3	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. "L" when erasing protection tab is bent. "H" when not bent.
*2. Pulse of period in proportion to reel rotating speed.
*3. Approx. 2 msec period "H" pulse.
*4. Pulse.
*5. 3 value output of "H", "L" and "HIZ (2.5V)".
*6. Normally "L".2 msec period "H" pulse when tape top or tape end is detected.

4-5. SYSTEM CONTROL–SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA3 BOARD IC501)

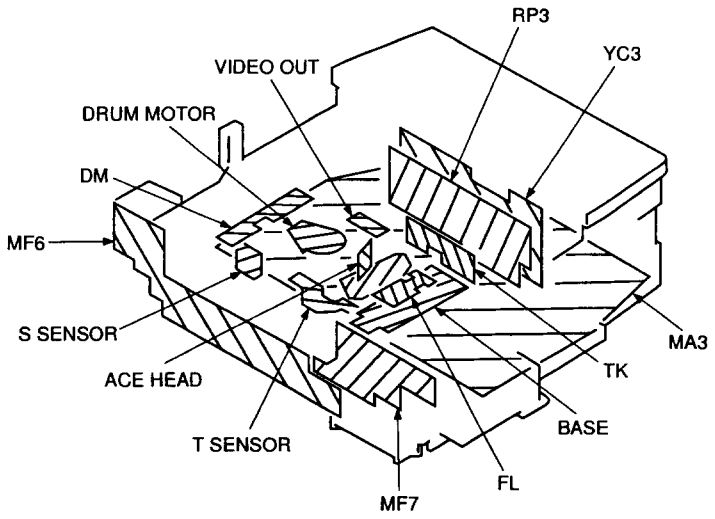
Signal	Pin. No.	I/O	I/O level
$\overline{\text{COSMO-RESET}}$	MA3 Board IC501 ㊵	I	Nomally "H". "L" when service interruption is detected or restored.
$\overline{\text{COSMO-CS}}$	MA3 Board IC501 ㊹	I	Chip select signal from timer microprocessor. V period "L" pulse.
SI-BUS	MA3 Board IC501 ㊺	I	Serial communication data to timer microprocessor. V period "L" pulse.
SO-BUS	MA3 Board IC501 ㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
$\overline{\text{S CLK}}$	MA3 Board IC501 ㊼	I	Serial communication clock with timer microprocessor. V period "L" pulse.

4-6. SYSTEM CONTROL–AUDIO BLOCK INTERFACE (MA3 BOARD IC501)

Signal	Pin. No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UN-LOADING	PB	PB-PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC-PAUSE
A PB	MA3 Board IC501 ㊹	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	MA3 Board IC501 ㊺	O	L	L	L	L	H	H	H	H	H	L	L
A PB/REC	MA3 Board IC501 ㊸	O	L	L	L	L	L	L	L	L	L	H	L
$\overline{\text{SP}}$	MA3 Board IC501 ⑩	O	*1	*1	*1	*2	*2	*2	*2	*2	*2	*1	*1

*1. Selected by SP/EP selector. SP mode: "L", EP mode: "H".
*2. Selected by tape recording mode. SP mode: "L", EP mode: "H".

5-3. CIRCUIT BOARDS LOCATION (VIDEO SECTION)



5-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS (VIDEO SECTION)

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytic.
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch: 5 mm Rating electrical power 1/4 W (CHIP : 1/10 W)

- All resistors are in ohms.
- : nonflammable resistor.
- : fusible resistor.
- △ : internal component.
- : panel designation, and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth-ground.
- : earth-chassis.

- All voltages are in V.
- Readings are taken with a 10 MΩ digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerances.
- * : Can not be measured.
- Circled numbers are waveform references.
- ▬▬ : B + bus.
- ▬ ▬ ▬ : B – bus.
- ⇨ : Signal path.
- no mark : REC/PB mode (SP)
- ( ) : REC mode (SP)
- < > : PB mode (SP)
- [ ] : RF

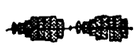
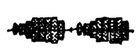
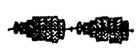
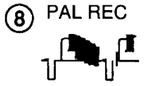
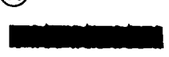
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

WAVEFORM LIST

● YC3 BOARD

① PAL PB 0.5 Vp-p (H)	① SECAM PB 0.6 Vp-p (H)	② PAL REC 0.4 Vp-p (H)	② SECAM REC  0.2 Vp-p (H)	② PAL PB 0.2 Vp-p (H)	② SECAM PB 0.06 Vp-p (H)	③ 0.6 Vp-p (4.43MHz)	④ PAL PB 1.2 Vp-p (H)
④ SECAM PB 1.0 Vp-p (H)	⑤ PAL PB 0.2 Vp-p (H)	⑤ SECAM PB 0.2 Vp-p (H)	⑥ PAL PB 0.4 Vp-p (H)	⑥ SECAM PB  0.25 Vp-p (H)	⑦ PAL PB 0.6 Vp-p (H)	⑦ SECAM PB  0.4 Vp-p (H)	⑧ PAL REC  2.5 Vp-p (H)
⑧ SECAM REC 2.5 Vp-p (H)	⑧ PAL PB 2.0 Vp-p (H)	⑧ SECAM PB 2.8 Vp-p (H)	⑨ PAL REC 1.2 Vp-p (H)	⑨ SECAM REC 0.9 Vp-p (H)	⑩ PB  0.3 Vp-p (H)	⑪ REC 1.0 Vp-p (H)	

VOLTAGE LIST

• MA3 BOARD (2/2)

Ref.	Pin No.	Voltage [V]
IC301	①	0.1 (1.1)
	②	5.1
	③	0
	⑤	12.3
	⑥	5.2
	⑧	5.2
	⑨	0
	⑩	5.2
	⑪	0.4 (4.9)
	⑫	5.8
	⑬	5.2
	⑭	0
	⑮	5.9
	⑯	5.8
	⑰	0
	⑱	5.8
	⑲	5.9
	㉑	5.9
	㉒	5.9
	㉓	0 (0.7)
	㉔	0.8 < 5.0 >
IC501	①	0 (2.7)
	②	0
	③	0
	⑤	0
	⑥	0 < 5.2 >
	⑦	2.6 < 3.1 >
	⑩	0
	⑪	0
	⑫	0
	⑬	5.5
	⑭	0
	⑰	0
	⑱	0
	⑲	0 (*)
	⑳	4.3 (*)
	㉑	0
	㉓	0 (5.4)
	㉔	5.4
	㉕	5.4 (0)
	㉖	0
	㉗	5.4 (0)
	㉟	2.8
	㊱	2.8 (0)
	㊲	7.6
	㊳	0 < 3.0 > (2.4)
	㊵	* < 5.5 >
	㊷	2.7
	㊸	2.6
	㊹	5.2

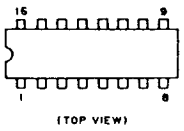
Ref.	Pin No.	Voltage [V]
IC501	㊺	2.9
	㊻	0.7
	㊼	0 (5.4)
	㊽	4.5
	㊾	0
	㊿	0
	(51)	0
	(52)	0 (5.3)
	(53)	0
	(54)	0.5 (1.9)
	(55)	1.3
	(56)	1.5 (0)
	(57)	1.2 (0)
	(58)	1.2 (0)
	(59)	0 (3.1)
	(60)	0
	(61)	4.6 (2.3)
	(70)	0 (2.5)
	(72)	0
	(73)	1.1 (2.6)
	(74)	5.5 (2.6)
	(75)	0 < 5.4 >
	(76)	0
	(77)	0 (3.1)
	(85)	0 < 0.9 >
	(91)	0
	(92)	0
	(93)	0 < 5.4 >
	(94)	0
	(95)	0
	(96)	0 < 5.4 >
IC502	①	0 (3.1)
	②	0
	③	1.3
	④	2.5
	⑤	2.5
	⑥	2.5
	⑦	2.5 < 2.9 >
	⑧	2.5 < 3.2 >
	⑨	2.5
	⑩	2.6 < 3.1 >
	⑬	0 < 5.4 >
	⑭	2.5
	⑱	2.6
	⑲	2.6
	⑳	2.6
	㉑	2.6
	㉒	2.6
	㉔	2.6

Ref.	Pin No.	Voltage [V]
IC503	①	8.6 (3.5)
	②	1.1 (2.6)
	③	2.6
	⑤	2.6
	⑥	5.4 (2.6)
	⑦	0.5 (1.7)
IC504	②	0.6
	③	0.8
	⑤	0
	⑥	0
	⑨	0.8
	⑩	0.6
IC505	①.	4.3 < 1.4 > (*)
	②	2.6
	③	5.2 (*)
	⑤	0.2 < 1.1 > (*)
	⑥	2.6
	⑦	0 (*)
	⑧	1.2 (0)
	⑨	2.7
	⑩	2.6
	⑫	2.6
	⑬	2.7
	⑭	1.5 (0)
IC506	①	8.7 (5.2)
	②	3.1 (2.6)
	③	3.2
	⑤	7.8
	⑥	7.8
	⑦	7.8
IC507	①	8.1 (4.0)
	②	2.6
	③	2.7
	⑤	3.9
	⑥	7.8
	⑦	0
Q301	B	0 < 5.4 >
	C	12.4 < 0 >
Q302	B	12.4 < 0 >
	C	0.3 < 12.1 >
Q303	B	0.3 < 0.1 >
	C	0.2 < 11.6 >
	E	0 < 0.2 >
Q501	B	8.7 (5.2)
	C	0 (2.5)
Q503	B	10.7 (10.2)
	C	2.4 (3.1)
	E	11.0 (10.5)

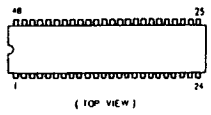
5-5. SEMICONDUCTORS

(1) TV Section

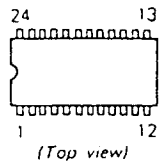
BA5412-S
CXA1315M



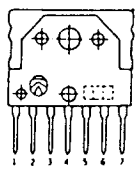
CXA1213BS



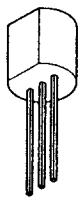
CXA1214P



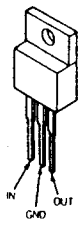
LA7830



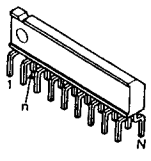
NJM78L12J
μPC78L12J



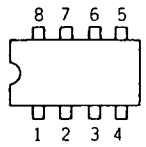
NJM78M09FA
TA7809S



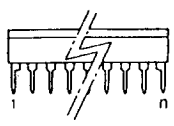
STR-S6708



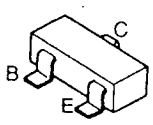
TEA2031A



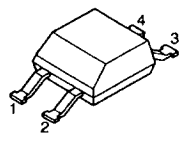
μPC1406HA



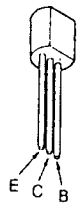
DTA114EK
DTC144EK
UN2113
UN2213
2SB709A-R
2SD601A-R
2SD601A-S



PC123F2



2SA1091-O
2SA1091-R



2SA1175
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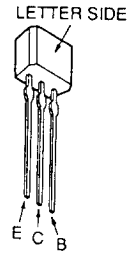
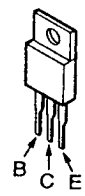


2SA1837



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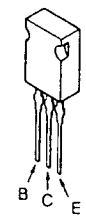

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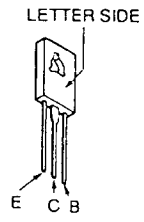
2SC3271-N
2SC3271F-N



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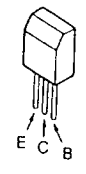

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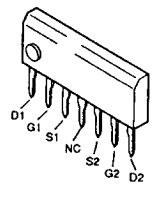

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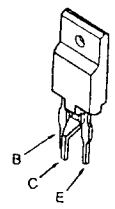
2SD1877-CA
2SD1877S-SONY-CA



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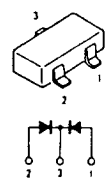
DAP202K



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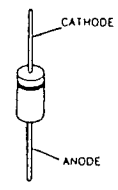
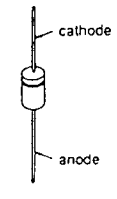
EGP30DL
EG1
EU1Z
EU-1ZV1
EL1Z
RGP02-17EL
RGP10G



ERC06-15S
RGP15J-6040
R2M
R2M-V1



MTZJ-11A
MTZJ-4.3A
MTZJ-4.7A
MTZJ-5.1A
MTZJ-5.6A
MTZJ-6.8A
MTZJ-7.5A
RD11ESB1
RD4.3ESB1
RD4.7ESB1
RD5.1ESB1
RD5.1ESB2
RD5.6ESB1
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RD6.8ESB2
RD7.5ESB1
RD7.5ESB2
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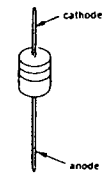
1SS119-25



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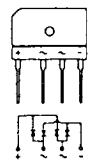
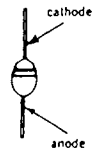
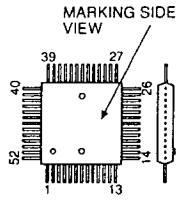
D4SB60L-F



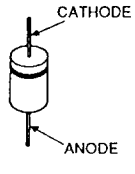
GP08D



RU-1P



RU4AM
RU4DS



(2) Video Section

AN7805F
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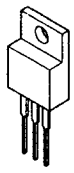
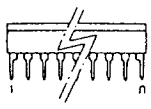
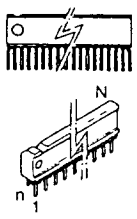
NJM7805FA
TA7805S
TA7809S



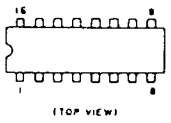
BA7611AN



BA7025L



LA7376-A



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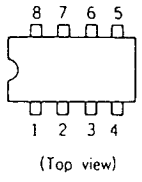
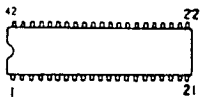
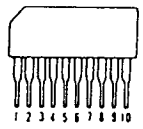


LA7396

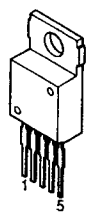


(Top view)

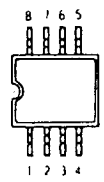
LB1641



MC14052BF

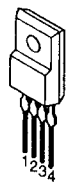


NJM4560M
μPC358G2
μPC358G2-E2
μPC393G2
μPC393G2-E1

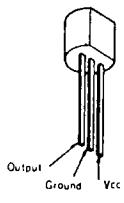


(TOP VIEW)

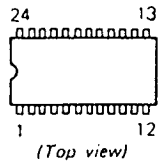
PQ12RF11



PST572H

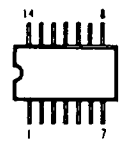


TA8823N



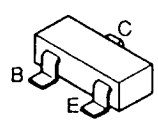
(Top view)

μPC324G2-E1
μPC324G2

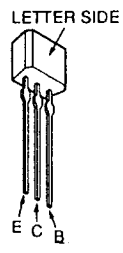


(TOP VIEW)

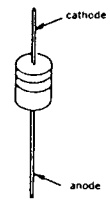
DTA114EK
DTA114YK
DTA124EK
DTA143EK
DTA144EK
DTC114EK
DTC124EK
DTC143XK
DTC144EK
UN2111
UN2112
UN2113
UN2114
UN211L
UN221F
UN2211
UN2212
UN2213
2SA1037K
2SA1162-G
2SB709A-R
2SC1623
2SC2412K-QR
2SD601A-R
2SD601A-S



2SA1175
2SA1309A

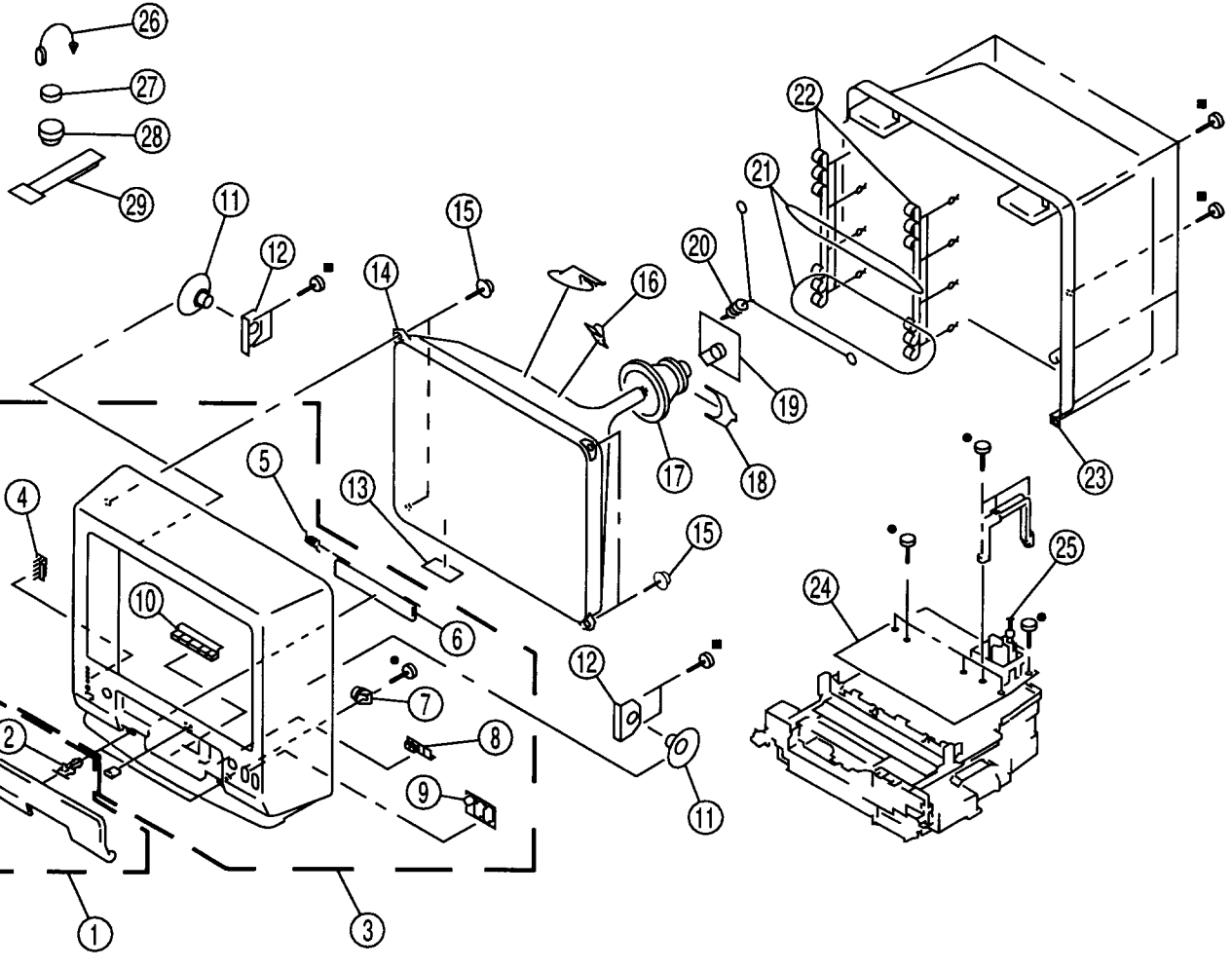


MTZJ-33A
MTZJ-5.1B
MTZJ-6.2
MTZJ-6.2B
MTZJ-9.1
MTZJ-9.1A
RB441Q
RD33ESB1
RD5.1ESB2
RD6.2ESB
RD6.2ESB2
RD9.1ESB
RD9.1ESL
1SS119-25



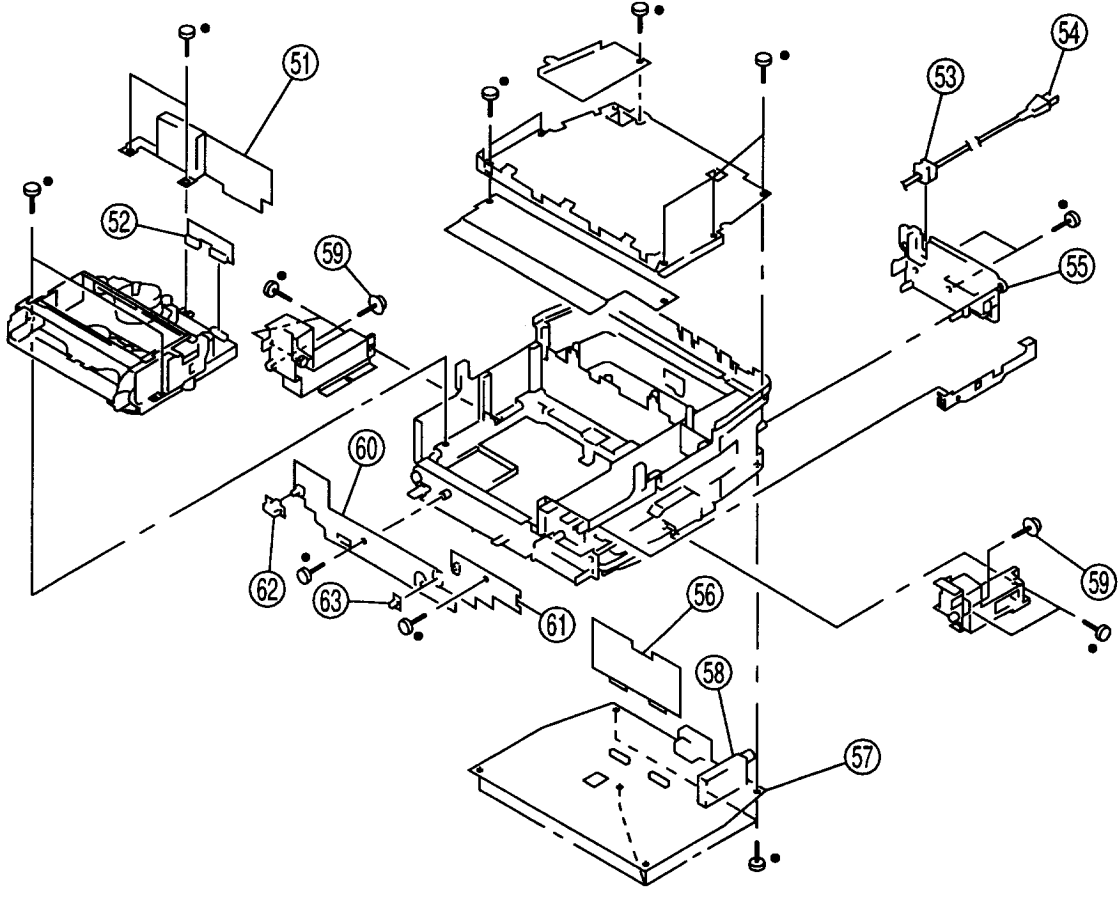
6-1. PICTURE TUBE

● : +BVTP 3X12 7-685-648-79
■ : +BVTP 4X16 7-685-663-79



6-2. MAIN BOARD ASSEMBLY

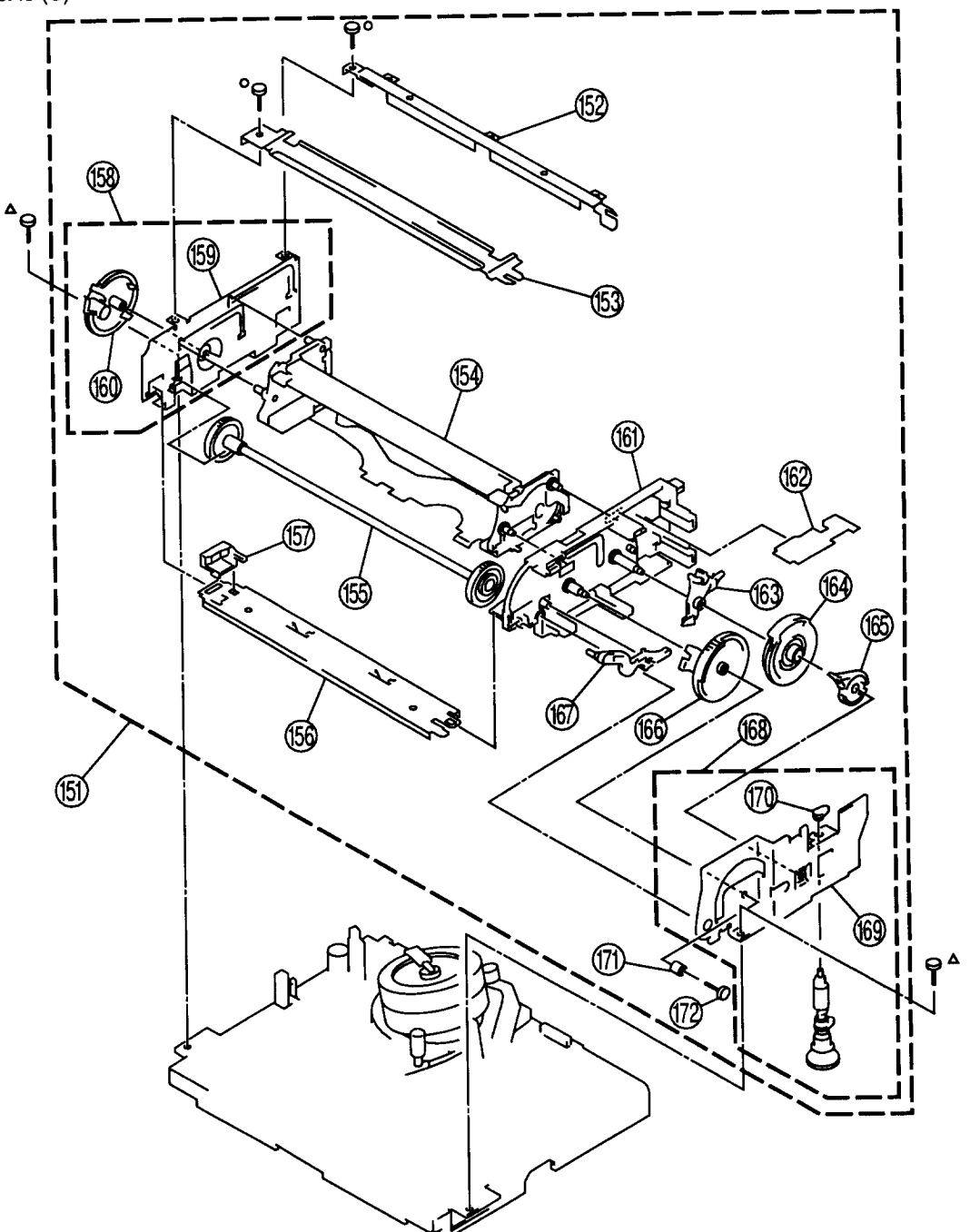
● : +BVTP 3X12 7-685-648-79



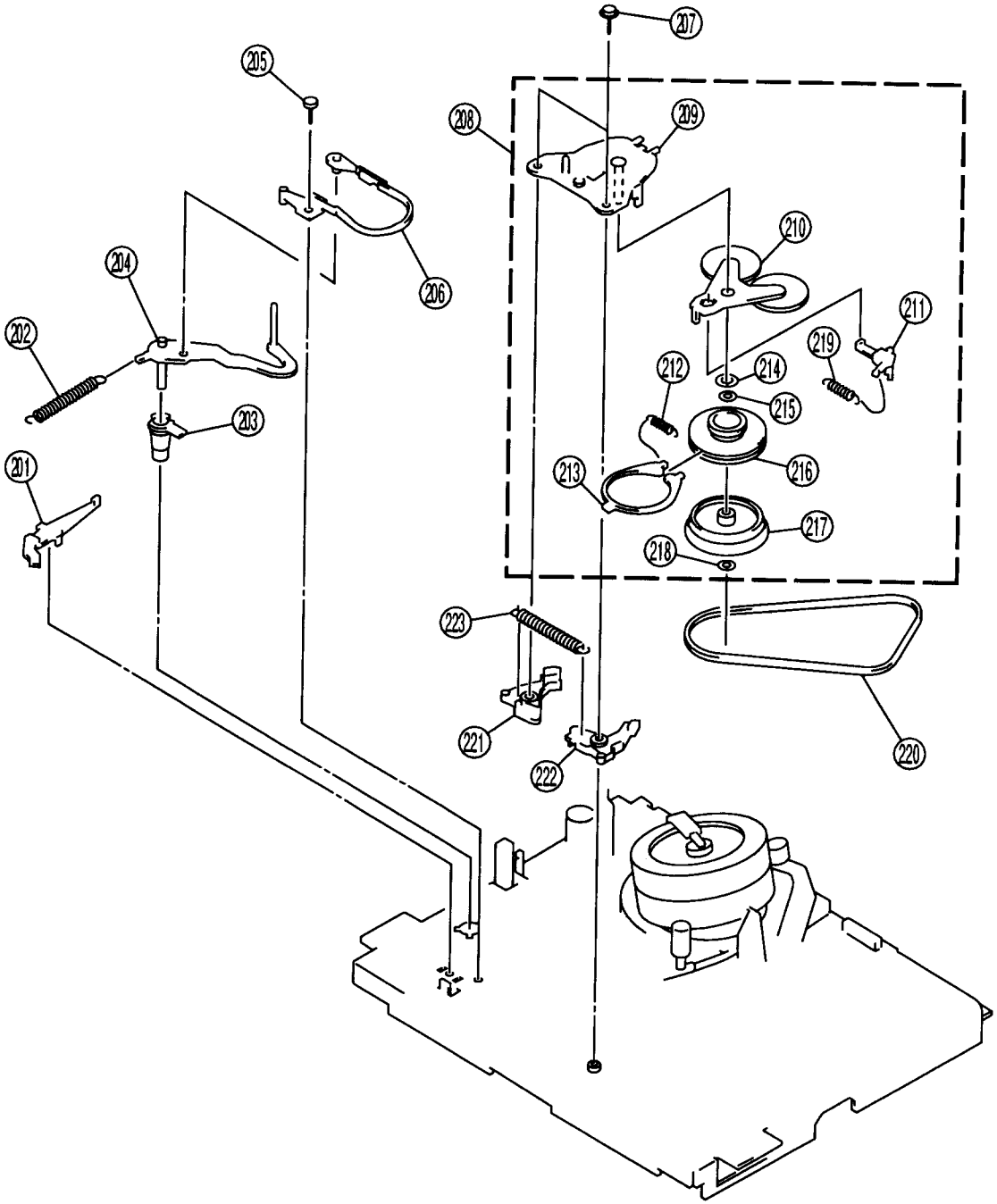
6-1. FL CASSETTE COMPARTMENT ASSEMBLY

○ : +PTT 2.6X4 (S) 7-621-773-86

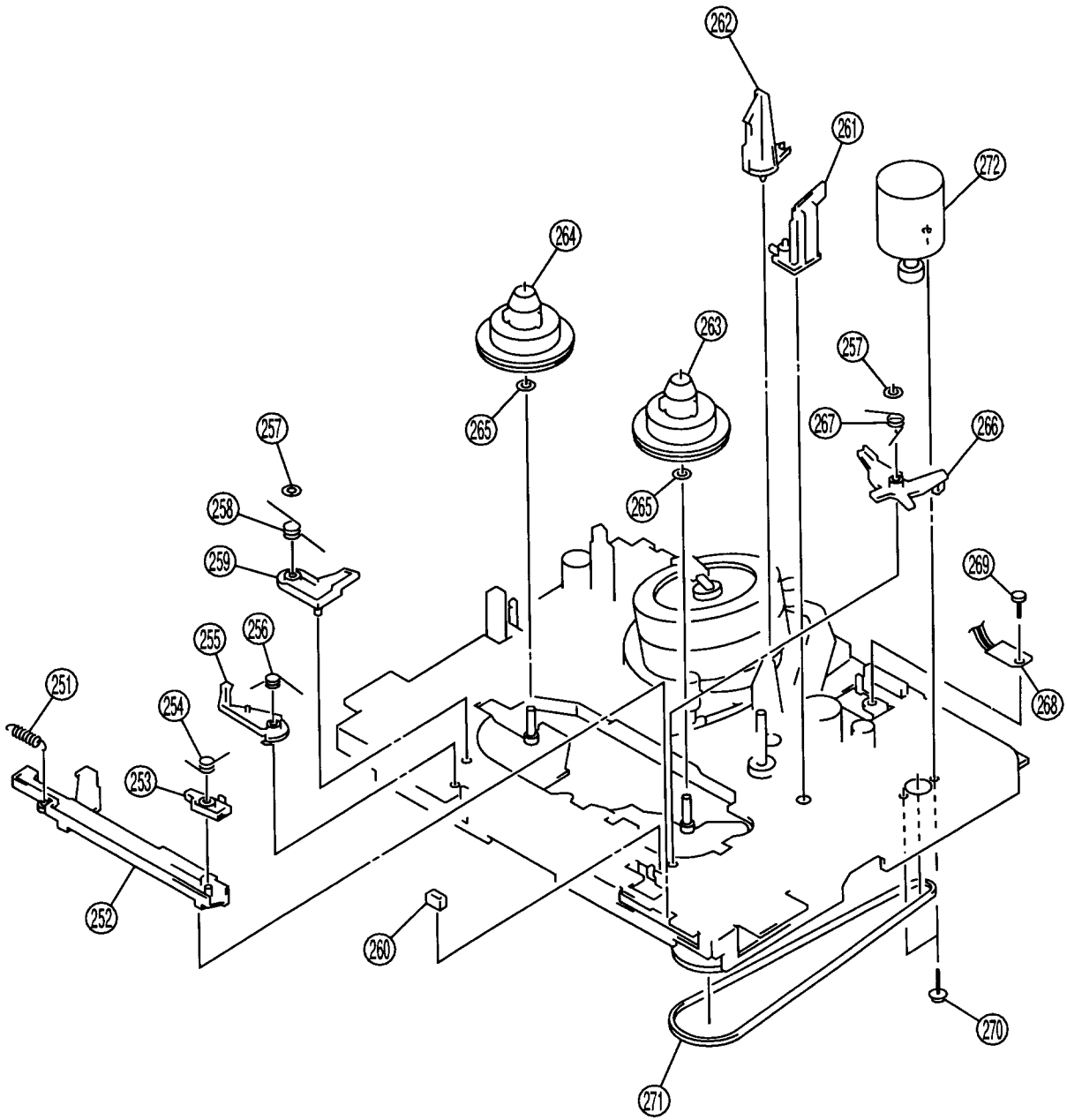
△ : +PTT 2.6X5 (S) 7-621-770-87



6-2. MECHANISM CHASSIS ASSEMBLY 1

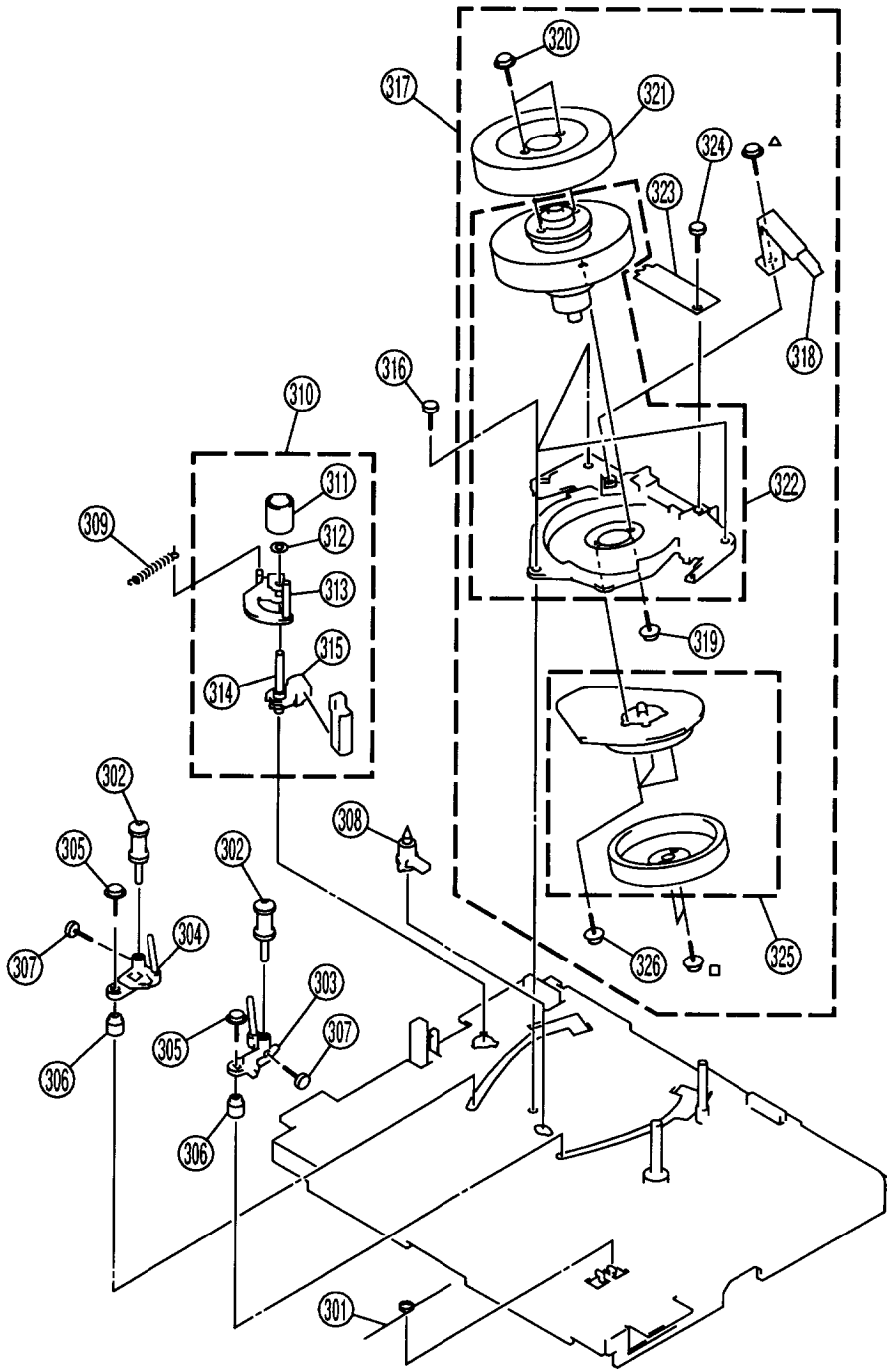


6-3. MECHANISM CHASSIS ASSEMBLY 2

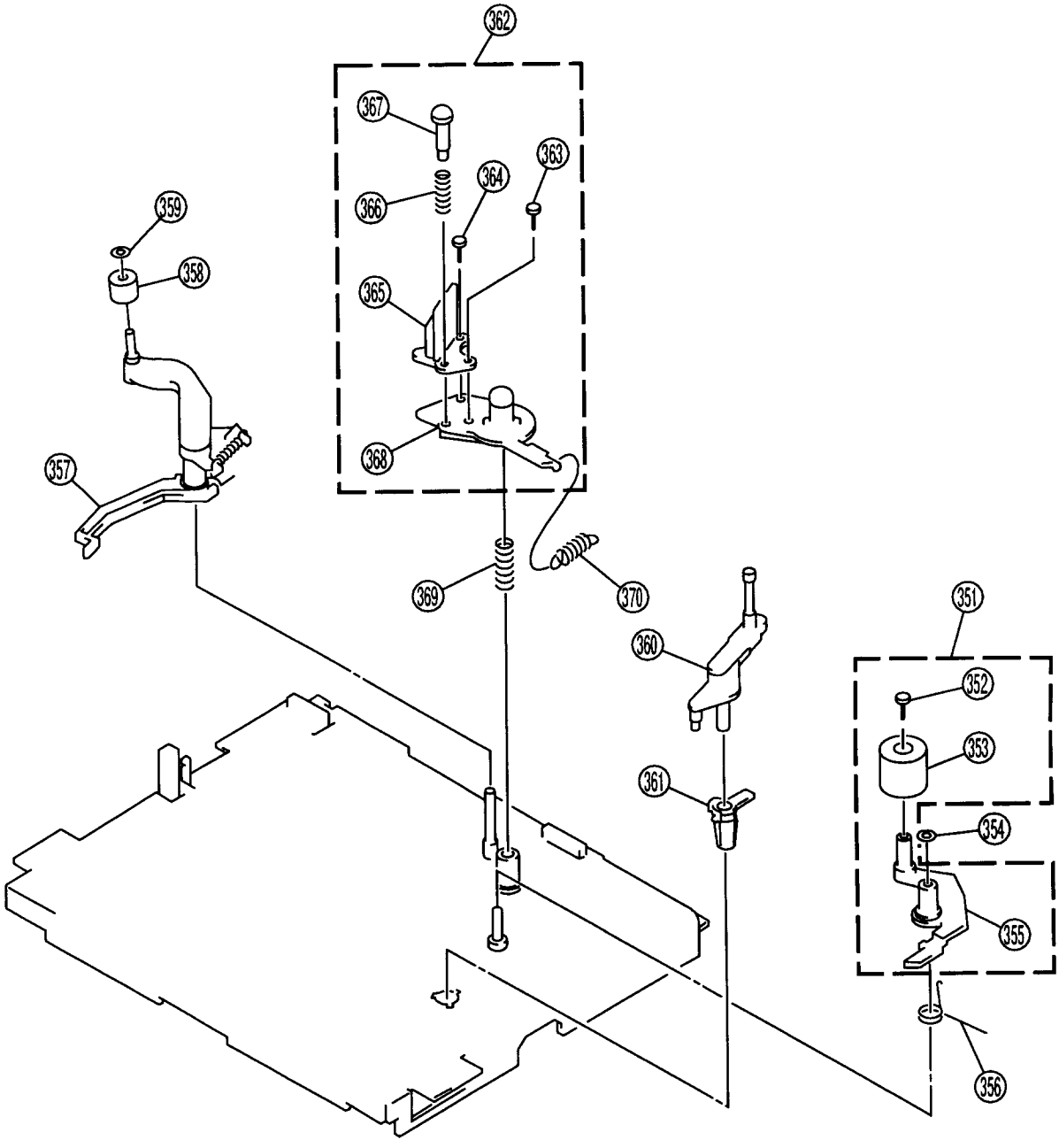


6-4. MECHANISM CHASSIS ASSEMBLY 3

△ : +PTT 2.6X5 (S) 7-621-770-87
□ : +PS 2.6X5 (S) 7-628-254-05

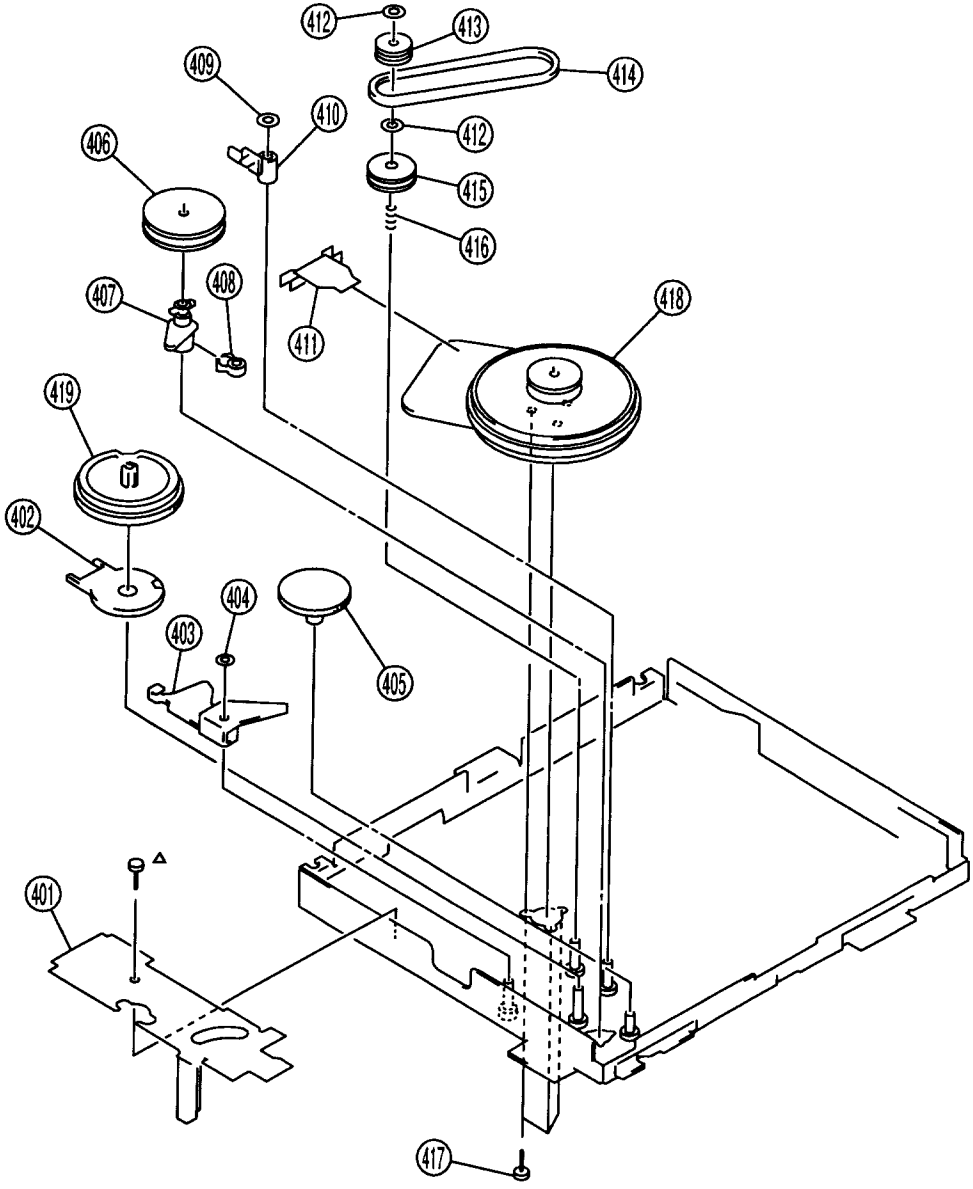


6-5. MECHANISM CHASSIS ASSEMBLY 4



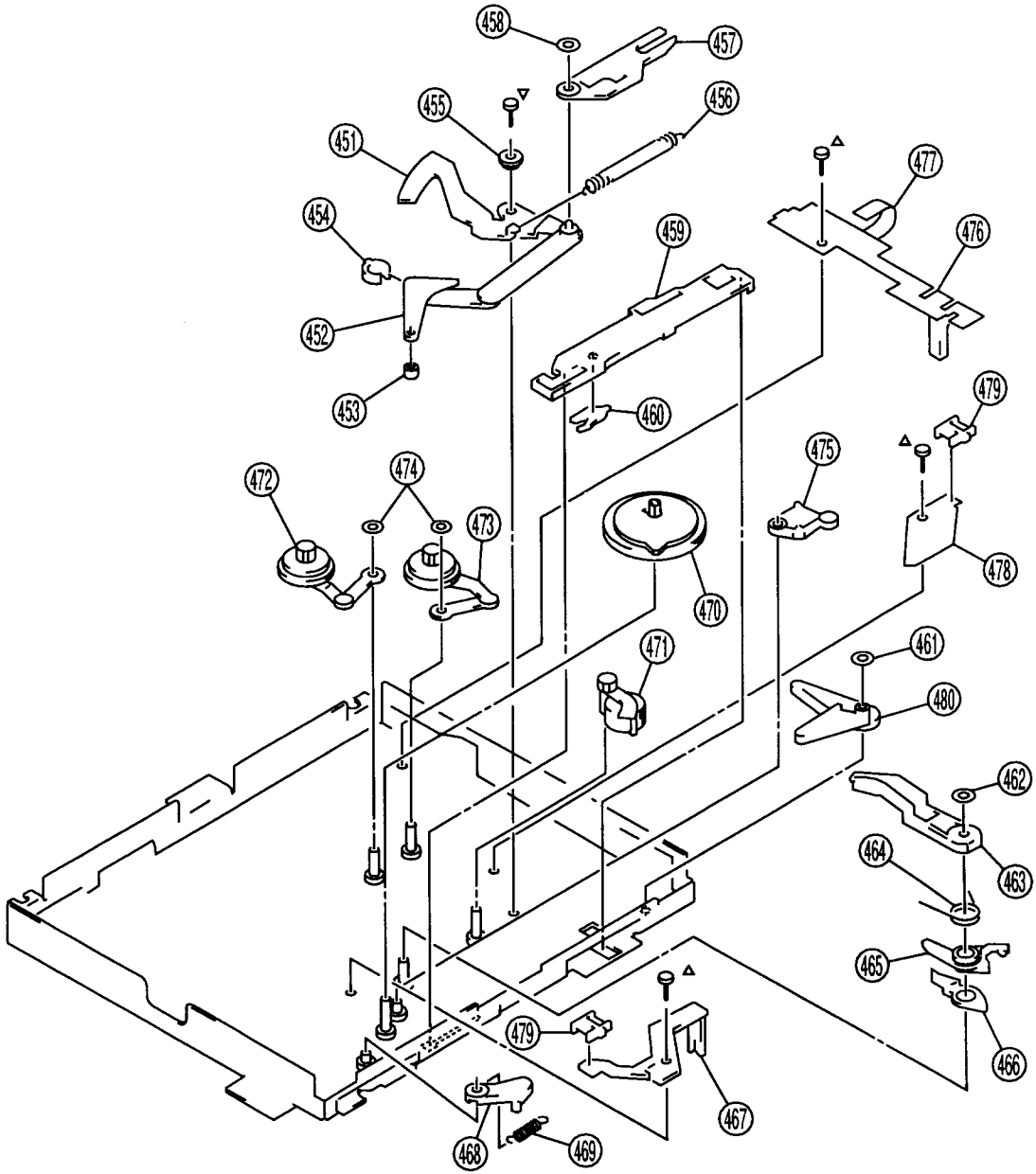
6-6. MECHANISM CHASSIS ASSEMBLY 5

△ : +PTT 2.6X5 (S) 7-621-770-87



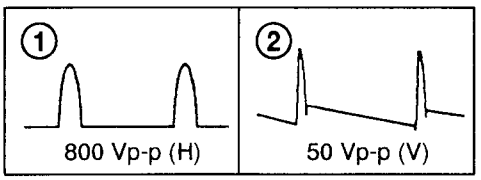
6-7. MECHANISM CHASSIS ASSEMBLY 6

△ : +PTT 2.6X5 (S) 7-621-770-87
▽ : +PTT 3X6 (S) 7-682-547-04



WAVEFORM LIST

● D3 (1/2) BOARD



Schematic diagram

D3 board (1/2) ➡